

# TRIBE and polity in late prehistoric Europe

Demography, production, and Exchange in the Evolution of Complex Social Systems



A Here creeps out of Saint Filchers denne, a packe of prowling mates,  
Whose lustfull to the English pale, and noysome to the States,  
Which have no more their country birth, then those of the English race,  
But yeld to each a lyke good turne, when as they come in place.

B They spoyle, and burne, and beare away, as fitt occasions serve,  
And thinke the greater ill they doe, the greater paye they deserve:

2 They passe not for the poore mans cry, nor yet respect his teares,  
But rather try to see the fur, to shoo about his eares.

C To see both flame, and smouldring smoke, to see the christall shewes,  
Next to their pray, therein I lay, their second glory lies:

And thus bereaving him of house, of cattell and of store:  
They do returne backe to the wood, from whence they came before.

Edited by  
D. Blair Gibson and  
Michael N. Geselowitz

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Exchange in the Evolution of  
Complex Social Systems

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To  
Emily Schneider  
and  
John C. and Gertrude H. Gibson

## FOREWORD

When we first began to discuss the possibility of a symposium on later European prehistory, our motives were entirely pragmatic rather than theoretical. There seemed to be a very limited number of forums in which we could present our own data, as well as to hear that of our colleagues with similar interests. While there are a number of American archaeologists who study European prehistory, the vast majority of them are concerned with the origins of agriculture and even earlier events, and these seemed to be the topics that dominated European sessions at meetings of the Society for American Archaeology.

Those colleagues who, like ourselves, were interested in issues involving the later prehistory and protohistory of that continent seemed always to end up giving papers at some random session where few members of the audience were interested in the specific data. As a result, many of these colleagues no longer bothered to submit papers for presentation at the SAAs, and some had given up attending the meetings on a regular basis. We felt that the time was ripe for a symposium purposefully bringing together scholars interested in the late prehistory and early protohistory of Europe, a time period that is considered to cover roughly the first millennia B.C. and A.D.

As we began to actually organize such a symposium, we realized that it was not enough just to bring these people together; it was essential that a coherent theme be chosen to hang the session together and to produce meaningful and interesting ideas that might have long-lasting value. As we reviewed the works of potential contributors, it became clear that the overriding concern of recent research by American archaeologists with respect to the later prehistory of Europe matched our own principal interest: the development of social complexity.

This area of study is an obvious one, as Europe at that time developed several sociopolitical institutions that were new to the region, but would characterize western society up until modern times. As an example, European feudalism, a sociopolitical form that has had great prominence in social theory since at least the time of Karl Marx, had its roots, if not its actual origins in this period. The foundations of the notion of democracy may be traceable to the tribal assemblies and councils of the Gauls, Germans, and other Indo-European peoples. Likewise, the possibly special nature of the western European capitalist "world system" that was to emerge out of feudalism undoubtedly had its roots in the dynamic structure of the early European states.

There has also been great interest, since at least the earliest of the works of V. Gordon Childe, in the role that interaction with the classical worlds of the Mediterranean and Near East played in the formation of European society. Conversely, some scholars are beginning to consider how the European "periphery" may in turn have influenced these dynamic "centers." It became apparent to us then, that colleagues in the fields of history and classics could add valuable insight to the discussion. So, we set out to organize the symposium, "Demography, Production and Exchange in the Evolution of Complex Social Systems in Late Prehistoric Europe," which was held May 9, 1987 at the 52nd Annual Meeting of the Society for American Archaeology in Toronto.

Participating were, besides the authors; Carole Crumley, Stephen L. Dyson, Bettina Arnold, Matthew Murray, and Kathleen Biddick. We attempted also to get a few of our European colleagues to attend, but none of them were able to, due to cost and time constraints. However, Janusz Ostoja-Zagórski generously submitted a paper which was read in his absence. The discussant was Bernard Wailes. Peter S. Wells could not attend, but read all of the papers in advance and submitted a discussion paper which Wailes read and then expanded upon. Afterward, the floor was opened for questions, and a lively discussion ensued. There was a general feeling that an attempt should be made to publish expanded versions of the papers of that symposium, and that our European colleagues should be reinvited to contribute in order to balance the presentation. This volume is the result.

As the work of organizing the volume commenced, it became clear to us that, while some of the papers dealt with methodologies for studying social evolution in late prehistoric Europe, the majority were concerned with developing a *theoretical* perspective that was applicable to this particular milieu. Therefore, we decided to co-author an introduction in which we summarize the past and current states of evolutionary social theory in European archaeology, and then present the paradigm that we feel best addresses the issues raised in the symposium. It must be stressed that while this theoretical construct is not, as the reader shall see, particularly novel, it is, in the context of this volume solely our own opinion, and should not be assumed to reflect the point of view of any of the other authors.

The volume is organized as follows: after this first introductory chapter, the papers are presented in groups by area. The second through fourth chapters are on western and northern Europe: Ireland (Gibson), England (Colin Haselgrove), and Sweden (Larsson). The paper by Blair Gibson explores the topic of divergence in the trajectories of social evolution through the description and analysis of the link between an agro-pastoralist subsistence base and the development of complex political systems in Late Iron Age (Early Historic) Ireland. Colin Haselgrove provides a thorough assessment of the potential and pitfalls of utilizing the Celtic coin issues of Late Iron Age southern England and Gaul as a tool for gauging the comparative degree of political centralization within polities of this period. Thomas Larsson expounds on what the evidence of settlements, rock art, and mortuary sites may connote with regard to periods of social and economic reorganization from the Late Bronze Age to the Early Iron Age in Central Sweden.

The fifth through seventh chapters are on east central Europe (Ostoja-Zagórski on Poland; Geselowitz, Murray on Yugoslavia). All of these contributions are concerned with the crucial Hallstatt Period, a time when northwestern Yugoslavia was witnessing the growth of Europe's first towns, while the Lusatian areas of Poland in the basins of the Oder and Vistula

basins were undergoing a demographic and social decline. Janusz Ostoja-Zágorski studies this transformation through the combination of demographic evidence from cemeteries, and the role of the organization of subsistence through catchment analyses of the micro-regions surrounding the Lusatian settlement sites. Michael Geselowitz and Matthew Murray each evaluate different aspects of the appearance of nucleated communities in Slovenia. Geselowitz examines the question of the consequences of the adoption of a novel technology, iron production, to the economy and society in this region, while Murray explores the potential of bone chemistry for gaining insight into early diet and social stratification.

The eighth and ninth chapters are on west central and southern Europe; Germany (Arnold) and Italy (Dyson) respectively. These last two chapters both express an interest in the role of the burgeoning classical world in developments in temperate Europe. Bettina Arnold explores the evidence and methodologies marshalled to identify slaves and the slave trade in Late Iron Age northern Europe. Stephen Dyson critically evaluates current and past paradigms, ideas, and methodologies which have been brought to bear in the analysis of the social constitution of the Roman state.

The last two chapters, ten and eleven, are summaries by Wells and Wailes respectively on their views of the overarching theoretical significance of the papers assembled here. Wells chooses to emphasize the significance of craft production and the symbolic aspects of craft goods in the development of social networks, and in the establishment of some of the earliest urban centers of Europe. Wailes provides a level-headed assessment of the potentialities and limitations of the archaeological record for providing inquiring scholars information on the social organization of past peoples.

Time will tell whether or not the positions advocated in this volume will have any significant impact on the field of European archaeology. However, a great measure of success can be claimed by virtue of the mere fact of very existence of this work. The degree of intellectual ferment present in European archaeology is amply attested by the diversity of stances taken by the authors within these covers. In a small way, this book bears witness to a tangible awakening in the minds of European scholars as they confront the potentialities of their rich data base for approaching some of the great questions of social and cultural behavior. It represents a statement of not only how far we as a profession have come, but also the tremendous distances we have yet to travel.

D.B.G.  
M.N.G.

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## introduction

THE EVOLUTION OF COMPLEX SOCIETY IN LATE PREHISTORIC EUROPE:  
TOWARD A PARADIGM

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Introduction

Bruce Trigger (1984) has pointed out that, despite obvious disagreements and paradigmatic battles within their field, American archaeologists since the advent of the "New Archaeology" hold several basic assumptions in common. The first of these is that archaeology, with the great time depth of its data base, is uniquely qualified among the social sciences to study change (ibid:276). It has been obvious since early in the history of modern archaeological science that change, rather than constancy has been the rule in the history of humankind. Even if one seeks to emphasize underlying patterns of similarity through time, it is the apparent change for which we must ultimately account. Thus, the study of social change, or evolution (to use the word in its general sense), must be one of the most important pursuits of archaeology, even though, as argued persuasively by Trigger, it need not be the only one (ibid:281ff.).

The second common assumption is that archaeology ought to be a science, and therefore should adhere to the rules of "Western Science," at least in the most general sense. Of these, the most fundamental is the idea that all hypotheses, however derived, must be falsifiable in some way so that eventually, in theory, competing hypotheses may be distinguished. As the data base improves, hypotheses will continue to approach a true description of an objective reality (ibid:279).

A third assumption (ibid:275-276) has become that, despite the early belief held by the "New Archaeologists" that archaeology must be anthropology (e.g. Binford 1962), archaeology is only anthropology in a broad theoretical sense. The dictionary definition of anthropology, "the science of man and his works" (Stein 1981:63), certainly includes archaeology, but the unique aspects of archaeology make it quite different in practice from the other subdisciplines of anthropology.

The vertical (in time) nature of archaeological data that is the strength of the discipline is also its weakness, since the horizontal spread of the data (the amount and types of data that come down to us in the archaeological record as compared to the universe of data about the human past) is so limited. In general, these data are in the form of material remains, and so by definition archaeology must take a more materialist approach than social anthropology, although there have been notable attempts by American Archaeologists to adopt a cognitive stance (Deetz 1967, 1977; Fritz 1978; Leone 1973, 1982).

Archaeology, although closely aligned to the social sciences, also has a foot in the camp of historical sciences such as geology, astronomy, and evolutionary biology. Its hypotheses can rarely be tested by controlled experimentation, and only occasionally by controlled statistical survey of a known universe. Although it has been argued that anthropology as a whole should be a historical science, thus reuniting the four subdisciplines (Aberle 1987), social anthropologists as a rule have shown little recent interest in this direction (ibid:551). Any paradigm that is to explain social evolution from an archaeological perspective must take into account this unique, "hybrid" nature of archaeology, and the nature of the archaeological data base.

This is not to say that such paradigms must be generated from within archaeology, since obviously no science exists in a vacuum. In fact, it would be splendid if other disciplines would borrow theory from archaeology as freely as we have borrowed from them. It does mean that archaeologists are entitled to borrow theory from either the social or historical sciences, but are also obligated to see that such theory is germane to archaeological research, and formulated appropriately. The purpose of this essay is not to review the recent exhilarating debate over evolutionary theory in archaeology (e.g. Dunnell 1980; Wenke 1981; McGuire 1983; Aberle 1987; Hammel & Howell 1987), but rather to propose a paradigm for social evolution that applies to our particular area of interest, that is later prehistoric Europe. We of course hope that such a paradigm has a more general application, and that it will be refined as scholars in our own and other subdisciplines examine it critically.

The presentation of such a paradigm is particularly important to the later prehistory of Europe for two basic reasons: first, the small number of American archaeologists focussing on this research area and, second, the fact that the processual/behavioral approach has not been widely adopted in Europe. There are, of course numerous practitioners of the "new archaeology," also known as processual archaeology in Britain and elsewhere in western Europe, many of whom are engaged in exciting research on the nature of social evolution (e.g. Renfrew et al. 1982; Bintliff 1984; Gallay 1987; Kristiansen 1982; Randsborg 1975, 1982; Claessen & van de Velde 1985a, 1985b). They do not, however, command a majority in prominent European archaeological circles. In eastern Europe a "pure" Marxist paradigm still dominates, although there are of course individuals pursuing other theoretical lines (e.g. Ostoj-Zagórski, this volume). In western Europe, notably Britain, there are besides processual archaeology three major theoretical schools: humanist, structural-Marxist, and structural/symbolic.

## Historical Background

Archaeology as a discipline in Europe grew out of the humanities. As has been well-discussed elsewhere (e.g. Dunnell 1980; Wenke 1981; Bintliff 1984a), the notion of social evolution was developed in Europe and pre-dates that of biological evolution; it was particularly espoused in the

years before Darwin by Herbert Spencer (e.g. 1842). It was originally based on the observation of the various degrees of sociopolitical organization then extant in the world, that is, the ethnographic record. Although many Darwinian concepts were subsequently adopted into social evolutionary theory (e.g. Tylor 1865), social evolution has remained a paradigm rooted in philosophy.

The great social thinker Karl Marx, as well as his collaborator Frederick Engels, absorbed this social evolutionary theory into their philosophical/economical model. Due to political reasons and the weight of tradition, this model is still adhered to in some parts of Europe despite its weaknesses vis-à-vis the archaeological record (Slaughter 1984:53-54). In America, due in part to the influence of Franz Boas, the evolutionary framework was consciously abandoned. Its excesses were in the course of time eliminated; for example the association between the model and racist sociopolitical movements. Archaeologists were left at a loss, however, to explain the changes that were becoming ever more obvious as the cultural-historical record of the world became more complete. American archaeology was not to emerge from this antievolutionary approach until after the Second World War.

Most European archaeologists, on the other hand, retained their commitment to evolutionary thought, although most researchers became concerned, toward the end of the 19th century and beginning of the 20th, with methodological and empirical advances. What good was this notion of evolution, if it could not be demonstrated in a meaningful way? The rapidly emerging data base, with its record of different societies at different levels of complexity, and its instances of rapid change, when considered within the paradigm of social evolution led scholars to believe that migration and diffusion were important mechanisms in causing social change. This idea was overused by such scholars as Christopher Hawkes, Stuart Piggott and Paul Reinecke, and was outright abused by such prehistorians as Grafton Eliot Smith and Gustav Kossina. Here was clearly a case of individuals imposing a worldview on the data, and not allowing the data to inductively suggest hypotheses, nor testing such hypotheses deductively. Diffusionism was more reasonably applied, however, by the young V. Gordon Childe (e.g. 1925).

Childe, the most important figure in 20th century European archaeology, did not remain static in his views. He was a great synthesizer, and clearly was concerned first and foremost with the truth as dictated by the record. He borrowed heavily from the Marxists; particularly the materialist aspects most appropriate to archaeology, but also explicitly viewed archaeology as part of anthropology (e.g. 1946, 1958). As John Bintliff has pointed out, Childe was "the prototype of the modern social archaeologist" (1984a:20).

Interestingly, after World War II, at a time when neoevolutionary theories began to reemerge in America, continental European archaeologists turned their backs on social evolution for the first time, perhaps due to the excesses of the application of social theory by the Nazi and Stalinist regimes. In parts of eastern Europe, a "pure" Marxist approach, with its evolutionary paradigm, continued unabated, but became ideologically rigid, and therefore outside of the realm of both the humanities and the social sciences. Marxist "laws" were assumed to be true, and the role of the prehistorian became only to demonstrate them in the archaeological record.

Elsewhere in Europe, migration and diffusion were still perceived everywhere in the archaeological record, but without the insinuation of progress or "social Darwinism." Archaeology became primarily a description of culture history, as it had been in America before the war, and was

still rooted within a humanist framework. Only beginning in the late 1960's did some European archaeologists begin to adopt a consciously social scientific paradigm, perhaps influenced by the theoretical revolution experienced by American archaeology in the early 1960's. This activity, spearheaded by David L. Clarke and Colin Renfrew, was particularly pronounced in Britain, where, as English-speakers, scholars would have been more in touch with American developments. But perhaps of equal consequence, where the work of Grahame Clark and Childe had laid the groundwork. As Stephen Shennan has recently pointed out, only in the last 10-15 years at the most can we observe in European archaeology a true proliferation of research that is not "artifact-typological, culture-historical studies concerned with charting the diffusions and migrations of prehistoric cultural traits" (1987:366).

The strong humanist tradition has, however, been reasserting itself with renewed vigor. At the forefront is a paradigm that seeks to apply Marxism with appropriate modifications and, at least superficially, less appeal to dogma and greater attention to the specific methodologies of prehistory; the so-called structural-Marxist school. Furthermore, some scholars consciously reject the positivism of the social archaeology, and purposefully seek humanistically-based paradigms, notably structuralism. In fact, Ian Hodder, the leading proponent of the structural/symbolic school of European archaeology, refers to his work as "postprocessual" (e.g. 1985). We do not mean to imply that American archaeologists have not applied humanistic models to later European prehistory (e.g. Crumley 1979:165-166), only that its occurrence is more prevalent among European prehistorians.

In his analysis, Shennan recognizes four theoretical schools in European prehistory: processual (1987:368-369); Marxist, including "neo-Marxist" and structural-Marxist (369-372); "global," including world systems and peer-polity interaction (373-376); and ideological (376-378). If we view the global approach as an attempt to apply processual or Marxist models with only a change in the scale of the units of analysis (Trigger 1984:284-286), then Shennan has identified the same three schools that we observed above.

We recognize that there have been a great number of incompatible models proposed for European social evolution, all within the rubric of social scientific thought. These have ranged from "neo-Malthusian" (e.g. Bintliff 1984b:174), to Wallersteinian (e.g. Frankenstein & Rowlands 1978) to even more blatant formalist-economic (Wells, this volume). However, these theories share a history of being generated within explicit theoretical frameworks that recognize the processual paradigm, and are capable of rejection through the marshalling of contradictory data. It is the non-verifiable approach which we reject.

Before proceeding to propose our own processual model to be added to the mix that already exists, we feel that it is appropriate to critique certain of the humanist models explicitly. This has been done elsewhere (e.g. Binford 1982, 1987; Wenke 1981; Earle and Preucel 1987), but we wish to focus on the problems as they apply to later European prehistory. As has been mentioned above, the old-school humanism and "pure" Marxism can be let to pass without comment. However, structural Marxism, with its apparent appeal to processualism, and structural/symbolic archaeology, with its conscious rejection of positivism, need to be reexamined, especially due to their following in modern European archaeology.

## A CRITIQUE OF CURRENT PARADIGMS

### Structural/Symbolic Archaeology

Though a kind of mystique surrounds structuralism (or more correctly, a mystification of those attempting to understand it) the underlying premises of structuralism are actually not all that difficult to comprehend (cf. Gellner 1982). The principal assumption of structuralism in its incipient stages was the universal, invariant structure of human thought processes (Levi-Strauss 1963:33-34). The substantive nature of human thought processes are felt to be perceptible only in their surface manifestations. Through the study of the regularities of the expression of the structure of the human mind, as manifested in language or culture, some knowledge may be gained of the human mind...or may it?

In archaeology, one is removed by another factor from direct access to the human mind as the cultural objects one finds are stripped of the meaning that living informants could confer (cf. Binford 1987 on this point). Those working under the structuralist paradigm, however, notably Ian Hodder and his students, do not overtly subscribe to the premise of the universal, intangible structure of the human mind (Hodder 1982b:9).

The central tenant of archaeological structuralism is the overarching importance of symbolic behavior in human societies.

"...answers to such questions must acknowledge culture as being meaningfully constituted in the sense that each material trait is produced in relation to a set of symbolic schemes, and in relation to general principles of symbolic meaning which are built up into particular arrangements as a part of social strategies." (Hodder 1982b:186)

Hodder strongly makes the case that archaeologists have heretofore ignored or avoided the critical role of meaning and world view in culture, opting instead for simplistic functional ecological models which disregard the critical role played by 'structures', or frameworks of ideas and concepts which ultimately generate the patterning of the material record which comes down to us (Hodder 1982a:187). The structuralist paradigm in contrast sets as its goal the assessment of the systems of symbolic meaning expressed by a culture. The origins of these systems of meaning are complex and diverse, corresponding as they may to either collective or individual needs (which may be expressed consciously or unconsciously), and they may also be a product of historical accretion. The situations which generate symbolic communication relate to the organization of a society and stresses upon it, the stresses it places on constituent classes of individuals, and its history.

Hodder argues persuasively for a methodology that hinges upon meaning, context, and history. The structures, or systems of symbolic meaning in culture are to be reconstructed through the integration of patterns recovered from the study of the different sets of material culture that express them. These structures are unique to each society, and are as much a product of historical accretions as they are of contemporary organizations (Hodder 1982a:228). It is through the study of the associations and patterning of material culture recovered from the archaeological record that the attitudes and thought systems can be discovered.

Further, material culture is held to exist in a dynamic relationship with the societies which produce it. By the daily acts of creation and use material culture transforms societies through the processes of symbolic



expression and manipulation. Ultimately, with progress in the discovery of the structures behind each specific instance of symbolic expression it is argued that it will be possible to construct general symbolic principles which will explain the specific instances (Hodder 1982a:215).

But how does one correctly interpret the patternings without the aid of living informants? How can one adjudge the correctness or quality of any one interpretation? How does one decide which materials are appropriate or meaningful in such a study? What are the limits on the number of structures that constitute the 'whole'? Are there ways to independently verify interpretations generated by this methodology? What are the criteria of 'proof' or 'disproof'?

The practitioners within the symbolic school express a genuine awareness and concern with these problems, and two responses, one positive and one negative, emerge. On the positive side, Hodder expresses an awareness of the charge leveled against structuralist practice in general that the interpretations or explanations offered seem to be so vague as to be impossible to refute. His answer is strongly in line with the methodology advocated by Levi-Strauss (1963: Chpt. 15) of the intensive analysis of the specific instance. Verification should lie in the construction of very clear and detailed interpretations couched in particular, historical contexts (Hodder 1982b:8-9; Wylie 1982:44-5). Hodder indicates that proposed structural relationships may be 'tested' (his quotation marks), however no criteria are proposed for the acceptance or rejection of any 'hypothesis' (our quotation marks) (Hodder 1982b:227).

On the negative side, the tendency within structural writings has been to equivocate the testing procedures advocated by processualists. The arguments range from the attribution of subjectivity to the testing process ('the testing of theory against assumption'), to the denial of cross-cultural regularities, or at least denial of their importance. Cross-cultural generalizations are held to be invalid due to the historic uniqueness of each specific cultural context (Hodder 1982b, 1984).

A criticism which has been raised in particular against the structuralist approach is the particularizing emphasis it advocates. This is inescapable, as Hodder himself states:

"..each particular historical context must be studied as a unique combination of general principles of meaning and symbolism." (1982a:218, cf. also 215, 228).

Hodder argues that cross-cultural comparison is not precluded, but should constitute the basis for the establishment of general principles of meaning. In practice, however, his methodology for making such comparisons is not entirely coherent. Such general principles as he offers are borrowed from interpretations of radically different social settings (e.g. comparing the notions of purity of contemporary English Gypsies with those of the Nuba) with scant justification for appropriateness offered. Other 'general principles', such as Turner's 'antistructure' principle (op. cit.:226) cannot be said to be either tested, or even supported by the methodology Hodder pursues. Rather they amount to vague, esoteric interpretations slapped on to capricious manipulations of archaeological data.

In this instance he falls into the same Levi-Straussian trap he claims to be avoiding; that of putting forth propositions too general to be falsifiable. To attempt to explain Nuba culture through the arraying of the data against universal binary oppositions (or rather, binary truisms) may give us some insights in the ethnographic instance, however it may

also block a complete understanding of those aspects of culture which are dictated by cognitive values which are neither opposed, nor binary. Given the particularizing and historical bent of structural archaeology, and the restrictiveness of the view of culture it advocates, few real generalizations are indeed possible.

Though Ian Hodder dismisses the approach and models of processualists in the most contentious of terms, he makes a poor case for their rejection. *Symbols in Action* (Hodder 1982a) was meant in part as an evaluation of the efficiency of interaction models put forward by processualists to explain distributions of attributes and objects. The structure of the test is elegant and should give pause to those who seek to identify ethnic groups through the distribution of the formal characteristics of artifacts, or who would construct models of the transmission of styles or items between groups based a single set of assumptions. However, his study cannot really be construed as a conclusive refutation of the value of interaction models.

Hodder does not really test interaction theory directly. In point of fact, through his analysis he develops a model of the constraints to interaction which poses no contradiction to the general assumption of the determinant role of social interaction in material transmissions proposed by behavioralists. Indeed, by spotlighting those factors which either inhibit or constrain interaction *Symbols in Action* may be viewed as contributing to the refinement of interaction theory.

#### *Conclusions on Structuralism*

In the structuralist paradigm, cross-cultural regularities are ignored or simply buttress explications of particular historical cultural phenomena. In this methodology, explanations are subjective, situational, and ad hoc. There is no interest in constructing concrete tests of conclusions arrived at under this methodology. Indeed, testing, the scientific method, and empirical reality are held to be capricious constructs of the culture of western science (Hodder 1984).

To acknowledge the structure of western science is, however, not sufficient grounds for rejecting it. It is a cultural system for the evaluation and interpretation of objective reality. That it is imprinted with the values of its practioners poses no danger as long as those practitioners remain conscious of the existence of those values. The test of a system of evaluation lies not in its origins, but in its consistency. To reject all standards of evaluation on this basis is specious as it is irresponsible.

To champion the importance of structure and meaning does not of necessity constitute a refutation of the superceding importance of social process. Rather, by implication the focus of inquiry is narrowed upon the ideational aspects of culture and those factors which generate them. The question must be asked 'do systems of symbolic meaning explain more about the dynamics of culture than do competing processual models.?' We believe the answer to be no. The cognitive aspect of culture is certainly important; probably more important than most American materialists are willing to admit. But in the spirit of Brecht we hold that ideology is subservient to the material concerns of everyday life.

#### **Structural-Marxism**

The structural-Marxist paradigm, which like structuralism was also originated by French anthropologists, has been actively promoted by

K. Ekholm, Michael Rowlands, Jonathan Friedman, John Gledhill, and Kristian Kristiansen among others. It fuses together those aspects of structuralism and Marxism which are arguably compatible. It is true that between Marxist and structuralist thought there exists much common ground.

Marxist thought overlaps with structuralism in the common interest in structures and their properties. Though avowedly materialist, a central tendency of Marxist scholarship has been the construction of historical archetypes, termed modes of production, which consist of configurations of the means and relations of production. In structural Marxism the determinacy in a mode production of the means of production is ascribed to the relations of production (social organization)

"It is the relations of production which are the determinants of the dominance of any one element. They have a central determining effect on the organisation of society, since they determine both this predominance and through it, the general organisation of society." (Godelier 1977:36)

The Marxists and structuralists are in general agreement that social organization represents only a surface reality that masks an internal true order (Godelier op. cit.:45). That surface structure which conceals a contradictory inner (covert) logic represents a 'mystification' in the jargon of structuralists, or 'fetishism' in the language of structural-marxists of the 'true' structure. In the framework of structural Marxism, fetishism refers to "...the non-correspondence between the internal goals defined by the categories of a social structure and the material effects of that structure." (Friedman 1982:180). Here the concept of fetishism elaborates upon that of mystification by imbuing it with a dynamic quality. Rather than a being a mere static structure, what is concealed by surface appearances are strategies which unselfconsciously effect cultural transformations.

The elements of change are said to be intrinsic to social systems, the causality of each system effecting its own transformation (Godelier 1977:93; Friedman 1982:179) This is equivalent to Marx's original concept of change in societies arising as a product of the conflict between contradictions inherent in a mode of production. In classic Marxist thinking this process is invariably identified as class struggle. Ideology plays an important role in this paradigm as well. Social organization is expressed and the asymmetry of some social relations are legitimized through ideology (cf. Kus 1984; Kristiansen 1984).

Where structuralism is unconcerned with origins or 'mechanical' evolution, structural-Marxists have been at the forefront in proposing evolutionary schemes (Friedman & Rowlands 1977; Gledhill & Rowlands 1982; Friedman 1982). An 'epigenetic' model of social evolution has been propounded by Jonathan Friedman, Michael Rowlands, and K. Ekholm (Ekholm 1972; Friedman and Rowlands 1977; Ekholm and Friedman 1979; Friedman 1982). The concept of 'epigenetic' evolution is a reworking of the premise of Godelier that the causality of each social system to be found in 'constraints' which are internal to the system (1977:45-58, 92-3, Friedman and Rowlands 1977:203). As stated above, this concept is directly derived from classical Marxism.<sup>1</sup>

There are three principal characteristics of the epigenetic model. The first, explicated above, is that the impetus to change is internal to a system. Second, the greater trajectory of regional social change consists of oscillations in the fortunes of all the various systems that taken together, compose the general tendency. Third, the actors or

operators within a system are not aware of the true 'structure' of a system with respect to their role in effecting change through pursuing social strategies that their roles dictate. Hence the fetishism, or mystification of the real structure of the system referred to above.

The model of Friedman and Rowlands seeks to reconstruct "systems of social reproduction characterized by a socially determined set of social relations." (1977:202). Those that are enumerated are tribal systems, asiatic states, prestige good systems (dualistic states), and territorial/city states. In this model the process of transformation from one social system to another is not effected by class struggle, since class development is a characteristic of state-level societies, but by the outcome of the interactions between components within the social system.

There is much to admire in this position. In complex societies the strategies of collectives at nodes within the social structure are important in promoting change to the structure. To view the environment as constraining or enabling change is also a correct assessment; the environment is but one factor among several (including history, available technology, population density) which taken together explain social organization and promote change. However, several critical theoretical weaknesses prevent unqualified acceptance of this paradigm.

First, the stages or systems they propose fail to account for the entire trajectory of human social evolution. One would think that in order to be completely satisfying, their model should explain the origin of inequality. However, social ranking is present from the start. In their tribal system, the lineages are ranked by relation to a common line of descent (1977:207), though seemingly lineage leaders do not exist. There is also ranking by wealth at the community level, expressed in competitive feasting and in the asymmetrical exchange of women (ibid:207-8). Their model seemingly accounts for the expansion of the family production unit through success in production, feasting and wife exchange (though 'debt slaves' appear *ex nihilo* to the system). However the appearance of social stratification in the tribal system in the form of absolute rank is not accounted for; it occurs as a result of being already present in the system.

"The final step and the one most crucial for further evolution, is the conversion of relative affinal rank into absolute rank. This occurs as an immediate result of the segmentary kinship structure and its place in the ritual economic system. As we saw previously, the form taken by interlineage ranking is one where affinal superiority is expressed simultaneously as 'age rank' or a closer genealogical link to the founder ancestor of the larger group so that the wife-giver/wife-taker relation is a relation of seniority between consanguineal ancestors. This form of ranking determines the structure taken by the chiefdom where a particular line, dominant in feast giving and affinal exchange, becomes identified as the direct descendant of the territorial deity." (Friedman & Rowlands 1977: 211)

So what is in fact being modeled is the emergence of more social inequality out of inequality. Initial tendencies towards inequality are exacerbated by success in the pursuance of social goals; goals for the attainment of social inequality. For a chief to appear in this system, he must have previously existed. The circularity in this argument is readily apparent.

A second theoretical defect is the lack of specificity of the systems they propose. Does the tribal system describe a 'big-man'/segmentary society or a chiefdom (both inequalitarian systems)? A polity with ranked lineages and leadership based upon propinquity to a central line of descent is considered by cultural ecologists to designate a chiefdom. If this is true, then the transformation of a tribal system to conical clan would have a chiefdom evolving out of a chiefdom, albeit a complex chiefdom evolving out of a simple chiefdom. Their asiatic state, possessing as it does semi-autonomous ramage under the aegis of a paramount conical clan does not in any way contradict the description of a complex chiefdom (see Gibson, this volume). Therefore, the first three stages in their scheme could be seen to describe chiefdoms of varying orders of complexity. Big-man systems are supposedly manifestations of this system in a 'devolved' state (Friedman & Rowlands 1977:213).

Inconsistencies arise in concrete analysis under this approach. Friedman's application of the model to Oceania characterizes the big-man societies of much of Melanesia as prestige goods systems and lumps them together with the island societies of western Polynesia (Friedman 1982). This is perhaps possible because the prestige-goods complex is defined by reference to an altogether different set of criteria than that used to develop the tribal system. It is not a social system so much as a description of appropriative strategy of elites. There is no structural contradiction between it and the 'asiatic state' or any other inequalitarian social system. The Tongan complex chiefdom is on an equal footing with a cluster of Melanesian lineages with their big men. The implication is clear that modes of the exchange of women and goods are determinant and the relative level of social complexity irrelevant in the development of this system of analysis. It seems that the epigenic model is not a theory of social evolution, but rather an approach for describing economic circulation.

#### *Conclusions on Structural Marxism*

The problems described above exist because Friedman and Rowlands choose to define their 'systems' utilizing subjective, qualitative criteria, resting on vague, unspecified terminology (e.g. corvée labor, debt slaves, peasantry, or 'dualism'). The distinctions they make shift in focus from system to system, considering cycles of production, feasting, and wife exchange at the tribal level, definitive rank and the mode of the appropriation of agricultural surpluses in Asiatic states, and the organization of luxury goods production and of inter- and intra-polity luxury goods exchange relations in prestige goods systems. Differences between systems exist in the presence of social and ideological 'dualism', or in the degree of development of craft specialization. In sum, their systems are everywhere and nowhere; the criteria are vague enough to describe societies arrayed along a great range of social complexity, but inadequate to fully distinguish any one of them from the rest. This defect must be interpreted as a natural outgrowth of a paradigm which insists on defining a system in terms of itself; a practice which fails to ascribe consistent values to social constraints across space or time.

This procedure of social analysis is an attestation of the fundamental idealist theoretical stance of structural Marxism. It represents a faith in the existence of a 'deep structure' of culture; a credence in archetypes. Cultures should manifest the entire list of traits of a system. When they don't, they are understood to be wholly or partially 'devolved'.

This position is analogous to A.L. Kroeber's concept of the culture climax (Kroeber 1939). There is an amalgam of traits which the fully-

developed cultures of certain geographical regions exhibit. Farther away from this culture core, cultures only imperfectly manifest these traits. They are viewed as dependent upon the culture core for the significant aspects of their cultural repertoire, and as incomplete cultures in so far as they imperfectly mirror the superior traits of their neighbors. In the structural-Marxist view, cultures are judged as to the extent to which they perfectly or imperfectly manifest social structures and traits which are held to be imbued with a significance, even in their absence. The teleology in this position is readily apparent.

The factors that are given to explain change in these societies are culled from the canons of Marxist or structuralist literature. Engels, writing in 1884 identified exchange as the critical factor which broke down the familial structure of preindustrial societies (1977:148). Through exchange, for the first time the product of labor deviated from the consumption of the producer, and surplus value (profit) was realized by an individual removed from the act of production. The importance of the systems of exchange of women between men was the centerpiece of Levi Strauss' *The Elementary Structures of Kinship* (1969). The principle of pervasive dualism is likewise a spin-off of the binary oppositions of structuralist theory. Though the primacy of exchange, and exchange of women as a determinant of social change remains to be concretely attested, purely as a dogmatic reflex these factors attain exalted status in the structural-Marxist scheme.

We believe that the importance of exchange to any society is variable. Friedman & Rowlands cite no data to back their contention that wife exchange is uniformly egalitarian in tribal societies, and that wealth differences and social change (leading to greater stratification) follow. Why shouldn't the converse be true?. Exchange as prime mover must be demonstrated, not accepted as creed. State development in areas such as the interlacustrine region of East Africa was apparently accomplished with little or no long distance exchange, and minimal craft specialization (cf. Posnansky 1975).

Structural Marxism is, after all, a theory of history. Though seemingly imbued with a sense of dynamic process, the model explicitly declares each system or level to be autonomous (read 'unique'), and defines them in terms of themselves. Hence the arguments of change are inherently circular, and statements of change amount to tautologies, or *faits accomplis*. The essence, therefore, of structural Marxism is not dynamic process, but stasis. The constraints which are said to produce change are invariant ideal constructs. The processes of change do not remain to be discovered, they are pre-established and dogmatic. The systems which are elicited under this paradigm may be said to contain the seeds of their own explanation.

"...a method is needed which avoids reducing observed social and historical reality to increasingly fine abstractions, a method which can represent, in thought, their internal structures and discover their laws of reproduction, non-reproduction and change. Conditions for structural reproduction change, but the changes are made according to laws expressing the particular characteristics of systems and are, therefore, constants."  
(Godelier 1977:92)

The structural-Marxist paradigm is therefore not equipped to deal with variation either in social complexity or in the nature of the subsistence systems. It seeks to classify or score societies as to the degree to which they manifest ideal characteristics of social morphology, traits which only may only relate fortuitously to actual evolutionary

processes. These traits exist rather as theoretical principles which owe their importance to the prestige of the schools of thought from which they originated. They are clearly irrefutable in so far as they are held to be significant even in their absence, and as the assumptions which generate them are covert or cannot otherwise be tested.

### **General Remarks on the Paradigm of the 'New Humanism'**

The preceding discourse has detailed the links between structural and structural-Marxist thinking. Essentially both approaches search for structure in culture; the former structures of meaning, the latter structured relations between the sources and expression of power. At a deeper level, these two schools rest upon an idealist premise concerning the nature of culture.

The organizing assumptions of symbolic archaeology concern a culture that is symbolically constituted. The fundamental manner in which mental behavior is constituted is assumed at the outset without reference to any concrete studies. The structural-Marxist perspective advocates the existence of forms of social organization which possess a significance beyond material causation and empirical reality. Further, in both schools the systems are structured by principles which have their roots in values. The refutation of hypotheses generated by these approaches lies not in comparison with empirical reality, but by the application of values inherent in the systems.

These two approaches are further united in the nature of their products; the methodologies they advocate and the kinds of studies they promote. In the past and present, the humanist tradition of archaeology in Europe worked within a purely inductivist framework. Prehistorians excavated sites for reasons of inspired curiosity. Synthetic studies pulled objects or sites of a similar type together, and from a consideration of their formal characteristics, discussed their origins and affinities. The greatest products from these scholars aspired to massive regional syntheses of material inventories, the context and quality of art forms, or the reconstruction and culture history of ethnic groups.

The general structure of the research produced under the structuralist and structural-Marxist schools is little different. Programs of data collection to address questions raised by these models have only been undertaken in ethnographic contexts (Hodder 1982b, Rowlands 1979). Every analysis produced by adherents of these schools is undertaken on a previously existing set of data. The only significant difference between this and previous humanist practices lies in the degree of sophistication of the data interpretations.

Consequently, both programs are lacking in coherent methodologies for data collection and evaluation. On one hand, this situation results from paradigms which either deny variation in cultural expression, or assume confirmation at the outset of analysis. This attitude precludes the generation of hypotheses and test implications which could generate studies resolvable by campaigns of excavation or survey. At root is a lack of interest in the testing of ideas.

If one rejects every criteria for the evaluation of ideas, save logical coherence, then can there be any progress in our understanding of prehistory? We think not. There can be no progress when it is not possible to judge or falsify ideas and propositions.

It seems highly likely that the upgrading in the sophistication of theory in the humanist tradition has been prompted by the tremendous pace of anthropological research during the last 50 years, and by the strides taken by theorists working in the scientific, empiricist tradition. The recent theoretical advances described above have aligned the humanist tradition with the challenge presented by the reality of the ethnographic and archaeological record.

## **TOWARDS A PARADIGM**

Change in the prehistoric record is at present best assessed by the study of institutions. By institution we mean nothing more explicit than the "...ordered ways of group living, ..patterns of interaction" or "social arrangements" and "culture patterns" of the earliest substantivist writings (Arensberg 1971:105-6; Pearson 1971:295). Human behavior is patterned on several levels. On one level, individuals have relations to one another which are dictated by sex, age, social position, inherent abilities and other like considerations. Their behavior is predictable within bounds by reference to these aspects of their roles, individual propensities, and the values generated by history and the socio-cultural context.

On another level, the interaction between the local environment, the specific economic adaptation of a society, and the demographic structure (including population density) call into being patterned behaviors (institutions) which in turn make up larger patterns within a total societal framework. This second level of institutedness, consisting of configurations of institutions, have a greater significance for cross-cultural analysis, and ultimately, for social evolution.

Steward, Sahlins, Service, and Polanyi among others take this view. The value of the earlier work of Polanyi has been somewhat diminished by the testing and subsequent falsification of specific hypotheses which he put forward (cf. Gledhill & Larsen 1982). However, the weaknesses in individual interpretations does not take away from the correctness of the general approach; the view of social organization as the primary expression and embodiment of culture change. We would argue further that social organization is man's primary adaptation to the challenges and stresses of his physical and social environment, and in later periods of his development, social organization itself becomes an agent (though by no means the sole agent) of change.

## **The Substantivist Approach**

One could say there are three principal aspects to the paradigm which we advocate; cause, structure, and change. To begin with structure, we contend that the starting point for an examination of cultural systems lies in the study of social organization. By the term social organization we mean all relationships that link together individuals occupying specific roles in any meaningful way. By the term 'meaningful way' we in turn mean that the understanding of the relationships in the minds of the actors sets out rules or a cognitive map by which future behavior can be predicted. These relationships must have an active aspect in structuring and channeling behavior in a consistent fashion.

From an evolutionary perspective, social organisation in its adaptive aspects comes to the fore. This may be approached from two levels of analysis. After Leslie White (1959), social evolution is seen as successive transformations in the scale of social systems which increase



the chances of survival of individuals against a background of declining levels of available per capita food energy. The overall size and constitution of the maximal social unit is then the important unit of analysis. From the standpoint of Steward (1955) the organization of the group in a manner to best utilize available food resources against the historic background of the development of food-getting and distributive technology and institutions is important. Our approach views as important and encompasses both of these levels of analysis. We embrace a definition of culture in the sense of White (1959) and Steward (1955) in which culture is seen as an extra-somatic response of man to his natural surroundings.

Evolutionary change is always premised upon the history of a given society. Whereas a given society may be viewed as unique as a cultural totality, the stimuli and behaviors which constitute an evolutionary process are not. An evolutionary response can be expressed in technology, ritual, and social structure, but these aspects of culture are not to be viewed as equal with respect to change and evolution. They may be ranked by their capacity to effect and respond to ecological stimulus, and by how completely they embody a response to conditions which impinge upon human society.

Both technology and ritual reflect the social entities which employ them; ritual bodies are forms of social organization and the level of technology consists to a great degree to the social bodies which integrate and manipulate it. For instance, plow agriculture depends upon the organization of the team of the plow, and the organization of cattle production. Religious ritual has been shown in numerous studies to reflect directly both the size and structure of societies (cf. Cancian 1965; Firth 1967; Rappaport 1967).

Julian Steward and Karl Polanyi have made primary contributions to the theory of social evolution and economic history. Because they worked in somewhat separate fields, and because Polanyi was not an avowed evolutionist, the structural correspondence between their work has not been apparent. However we feel that not only is their work highly complementary, it is possible to meld those aspects of their approaches which have withstood the evaluations and criticisms of the past into a unified program of great potential for the study of the past.

The link between Steward and Polanyi lies in the structure of their approach to the study of social evolution. In response to the great variation in environmental conditions worldwide, an enormous variety of specific socio-economic systems has been generated. However they came to the realization that within this myriad of social forms there were important regularities both in terms of structure and social behavior.

Steward approached the problem of the study of structure within socioeconomic variation through the concept of the *cultural core* (1979:94), which he defined in concrete terms as "the constellation of features which are most closely related to the subsistence activities and economic arrangements" (1979:37). However, in another instance in his work one finds another free-floating and ambiguous definition, the.... "functional interdependency of features in a structural relationship" (op. cit.:94), and as "the diagnostic features of any given era - the cultural core - will depend in part upon particular research interest, upon what is considered important." (op. cit.:93). It is clear by the context in which these two definitions of the culture core appear that they correspond to two distinctly different bodies of anthropological data; ethnographic in the first instance, and archaeological in the second. Their existence within the body of Steward's writing is perhaps testimony not so much to

confusion on his part, but to the trenchant divisions which existed in his day between the archaeological and ethnographic wings of anthropology (see below).<sup>2</sup>

Likewise, one can find in Steward's work two organizing concepts for the identification of societies distinguished or brought into comparison by the culture core concept; the 'level of socio-cultural integration', and the 'cultural type'. Steward said of the concept of the level of sociocultural integration that.. "In the growth continuum of any culture, there is a succession of organizational types which are not only increasingly complex but which represent new emergent forms." (op. cit. 51). It was clear that the trajectory and forms which characterized human social evolution in different areas in the world differed greatly, but there were widespread similarities in forms of social integration associated with specific modes of livelihood, amounting to the number of individuals which could be supported in a specific environment with a specific extractive technology.

In contrast, though the culture type definition integrates or subsumes the concept of the level of socio-cultural integration, it rests primarily on the second, arbitrary definition of the cultural core given above. Hence it lacks specificity, universality, and utility in general ("a cultural type consists of core features that, first, are determined by cross-cultural regularities of cultural ecological adaptation, and second, represents a similar level of socio-cultural integration" [1979:89]). Steward reserved the term 'cultural type' to designate this more general construct, however it loses diagnostic value by the loose way he utilized the term to describe cultural developments in prehistoric Peru (Steward 1979: Chpt. 11). The terms 'formative' or 'regional fluorescent' refer to no specific form of social integration, and clearly he had difficulty in integrating archaeological cultures as they were understood in the 1940's with his ethnographic analyses. Hence 'cyclical conquests' refers to no discrete social systems; but to periods of warfare and military expansion in the lifespan of primitive states (1979:196-8). It is preferable to utilize his concept of 'level of socio-cultural integration' with its specific reference to social complexity.

Polanyi defined the economy as "an instituted process of interaction between man and his environment, which results in a continuous supply of want-satisfying means." (Polanyi 1971:248) This seems like a narrower but kindred concept to Steward's definition of culture, and certainly pertains to the first definition of the cultural-core. The key to Polanyi's thinking lay not so much in the consideration of process (production), but in the institutedness of the economy. This institutedness "is achieved through a combination of a very few patterns which may be called forms of integration." (ibid:250) In Polanyi's understanding, these were three in number and related to modes of economic circulation. Further, these 'forms of integration' were subordinate to 'institutional arrangements'.. To be sure, we insisted that the integrative effect was conditioned by the presence of definite institutional arrangements" (Polanyi 1971:251). What this boils down to is Polanyi's view that the economy is subordinate to social organization, or 'embedded in non-economic institutions' as he put it (ibid:71).<sup>3</sup>

Whereas Polanyi brings definition to the economic aspect of integration, Steward's focus is on the social aspect. Polanyi's undeveloped 'forms of integration' are easily melded, or rather superceded by Steward's levels of sociocultural integration, and this has been in fact accomplished though not altogether consciously in the work of Elman Service (1962) and Marshall Sahlins (1958, 1963). Hence hunter-gather

societies were said to be marked by reciprocity, chiefdoms and big-man societies by the former and redistribution.

Achieving an integration of the ideas of Steward and Polanyi into a unified approach is then not a very novel concept in anthropology, and indeed, it is not a theoretical revolution that we are trying to achieve. It is proposed then, in the spirit of Steward himself (op. cit.:187), to eliminate those aspects of Steward's theory which are ambiguous or subjective, and to graft on those aspects of Polanyi's thinking which are complimentary.

First, we accept the definition of culture as man's extrasomatic means of adaptation. Second, it is necessary to more precisely define Steward's concept of 'levels of socio-cultural integration'; not difficult since he never defined it clearly in the first place. We define it as an organizational level of complexity of human society. This definition will have to refer to an understanding of evolution in social organization where levels of socio-cultural integration are 1) arbitrary in the sense that they are heuristic constructs to facilitate the study of cross-cultural regularities in social behavior, and 2) objective in the sense that the level of socio-cultural integration is defined according to an agreed set of qualitative characteristics or diagnostics. These diagnostics have as their point of reference disjunctive changes in the structure of social organization; e.g. the change from entrepreneurial leadership in segmentary societies to the establishment of a permanent office of leadership among chiefdoms; a change from kinship as a integrative principle in chiefdoms between the rulers and the ruled, to a polity unified by rule and force in the instance of primitive states.

We would like to make a further distinction between levels of integration, and phases within the levels to study differences in complexity which are not discrete, but which relate to differences of scale. Scale in the case of chiefdoms refers to the number of administrative levels within the maximal polity. By this we mean the difference between a chiefdom which has only one level of leadership, and in which the chief's power to intervene in food production is slight, and a chiefdom with three levels of leadership where the paramount chieftain has assistants who directly manage agricultural production. The concept of scale is therefore understood to refer to the organizational complexity of a polity.

The Polanyi substantivist paradigm is acceptable in so far as the economy up to the level of the primitive state is seen as a reflex of the wants and needs generated by specific social organizations. The substantivist paradigm is recognized as sound, even though specific historical hypotheses generated by the paradigm, such as the marketless character of archaic states are not. In the same manner as we view social organization as the institution of critical importance in the study of human social evolution, the instituted aspects of the economy should be the basis for analysis of the role of economic behavior in social evolution. This analysis should be inclusive, proceeding from the act of food procurement up to the level of the political economy.

The analysis should, then, carry beyond the identification and description of specific modes of economic circulation. The dictum of the economy as an instituted process should be extended to its natural limits, to the study of all instituted economic behavior; that is, economic behavior as a repetitive reflex of levels of integration and specific adaptations, including production and consumption.

## On Evolution

The last point to be made concerns the relation of the substantivist approach to evolution; that is, social change in its cumulative aspect viewed from a cross-cultural perspective. It is obvious by now that the model of evolution which this paradigm subscribes to is multilineal. What is perhaps not so obvious is that the model does not predetermine the sources of change in the manner of the structural-Marxist paradigm. We hold the stimuli and factors of change to be both internal and external to a social system.

Change to a social system can originate in trends or fluctuations in demography, change in the local ecology, from the introduction of a novel technology, ritual system, or social organization. The relative importance of any one source or factor of change will depend upon the history of a society and its relative level of social complexity. For instance, the introduction of novel religious practices might have a negligible effect on a hunter-gatherer social formation with respect to change in social scale, while on the other hand, a profound impact might be made on the organization of a primitive state. In order to study evolution per se, it is necessary to carefully define the scales of measurement as described above.

Though the model directs attention to levels of socio-cultural integration and modes of economic integration, it does not imply that variation in social formations and economic systems be overlooked in favor of typologizing societies by a set of invariable diagnostics. Research into levels of integration and instituted economic behavior should only constitute a prelude to what we consider to be the most important aspect of the strategy; the study of variation in social systems (vide Sanders & Webster 1978:277-80). The papers by Larsson and Gibson (this volume) exemplify this point.

This model also predicates an interest in origins, which is not a concern of the structural or structural-marxist paradigm. Hodder discusses at length the causal role of symbolic systems in ordering material culture without considering the origins of these systems. Whether or not social organization may have a determinative influence upon these symbolic systems is apparently irrelevant to the structural paradigm.

We hold important aspects of ideology to be an outgrowth of social organization, and would predict correspondences in ideological systems in societies of like level of integration. For instance, the legitimization of the social order in chiefdoms invariably has its basis in a cult of the ancestors (Firth 1957:77-81, 1967: Chpt. 5). Chieftainship in these societies is always sacerdotal, and a mana-like notion surrounds the division of the society into aristocratic and non-aristocratic sectors. It is neither possible nor desirable to tie all ideological and psychological activity to social organization, but it is important to realize that ideology does not exist *in vacuo*, and cannot be construed to have a primary, causal role in ordering other aspects of culture, certainly not in a general sense.

## STRUCTURAL CORRELATES OF THE SUBSTANTIVIST MODEL IN EARLY EUROPE

It remains to make an application of the model to the record of prehistoric Europe. However what follows here is by no means meant as an analysis, or an explication of methodology. The intention is merely to describe the evolutionary typology we advocate with reference to the archaeological record of Europe, to serve as the starting point for the

generation of testable hypotheses. Some aspects of the archaeological record are described for illustrative purposes. The descriptions of archaeological periods up to the first millennium B.C. are, however, highly provisional due to the author's lack of familiarity with the literature of the earlier periods.

#### Family Level Societies<sup>4</sup>

This level of socio-cultural integration characterizes peoples for whom the nuclear family is the most enduring social grouping. Family-level societies are distinguished by a lack of social cohesion above the level of the camp, work party, and seasonal or opportunistic communal food gathering undertaking. In other words, fluidity of membership distinguishes the social organization of family level societies at any level above that of the family.

Individual families agglomerate often but not always along kinship lines in instances when resources are concentrated, and fission when those resources become dispersed. Fission is also an outcome of the resolution of conflict and tension in family-level societies, and further contributes to supra-familial social fluidity.

The existence of sodalities above the level of the camp is attested, but ephemeral. Common language and ethnicity act to bind groups in a vague way (Birdsell 1958, 1973). This bind may become accentuated when a group's territory is challenged by persons of foreign ethnicity. The age sets of the Australian aborigines and clans are territorial units which seem to function to regulate marriage and allocate use rights to resources. Shamans and economic specialists (i.e. rabbit bosses) provide sporadic, situational leadership.

Family-level societies are nearly always identified with a hunter-gatherer economic adaptation, but there are also some societies of shifting agriculturalists and pastoralists, which exist at this level of integration (Johnson and Earle 1987). Sahlins' domestic mode of production ([1972]; compare with Bücher's household mode of production [1893], or Polanyi's householding [1968] *passim*) characterizes production and consumptive practices of societies at this level. Whether or not food is stored, and to what extent a group relies on stored food varies from locale to locale, and is probably a factor of the degree to which the local food sources lend themselves to storage and the degree to which food is seasonally available. That storage which exists is accomplished at the household level and is intended only for household consumption. Examples of food storage are to be found among the Miwok and Shoshone of California in the form of acorn granaries (Kroeber 1925: Plates 38, 60). of southwestern California.

Objects produced are generally portable. They are consumed by the producer or one of his family, or involved in casual reciprocal (generalized) exchanges. Occasionally, communal labor is involved in the construction of some special-purpose facility such as a trap for large ungulates or a large net for rabbits in communal hunts.

A great deal has been written about the archaeological correlates for societies of this type (e.g. Binford 1978a, 1978b, 1980; Gould 1977, 1980; Gould and Yellen 1977; Jochim 1976; Thomas 1973; Yellen 1977). Generally speaking, one should find the remains of small, non-permanent seasonally occupied campsites or villages. The structures which an archaeologist would encounter at a campsite would be insubstantial, indicating short-term occupation on a seasonal basis (a dichotomy between winter and summer

structures might be detectable on a regional basis).

The economic inventories of the campsites should also indicate seasonal procurement of food sources. The artifact assemblage of any one camp would be expected to be incomplete with respect to attesting to the totality of activities. Indeed, the settlement structure of an entire region would be expected to show an array of campsites attesting to the various structural poses of the food and resource procuring stratagem.

The evidence for individual roles should only point to role differentiation by sex, age, or achieved status. There should be nothing in the material inventory of the archaeological record of a family-level society indicating the special status of individuals, save the equipage of shamans.

The concentration of much of the literature on the pre-Neolithic systems has been on subsistence rather than social organisation. Many of the peoples of the European Middle and Upper Paleolithic pursued large herds of ungulates, and may have lived in sizeable, stable lineages, or even multilineage groupings. During the Mesolithic, current evidence suggests a shift in adaptation to smaller, forest-dwelling ungulates, and in some areas the establishment of small but concentrated groups on river or sea shore settings (Binford 1968; Cohen 1977:121-32; Newell 1973). These latter communities subsisted on aquatic resources on a seasonal basis (cf. Clark 1968; Woodman 1978, 1986).

The evidence of seasonal villages (cf. Srejovic 1967; Woodman 1985), multi-family cemeteries (Vallois 1961), and the biomass potential of the Mesolithic landscape could be taken as evidence that tribal level systems may existed in some areas. The mining and trading of porcellanite over long distances, and the apparent ceremonialism associated with these objects could be interpreted as support for this scenario. However, in most regions there is no evidence of any sort of overarching structure in residential areas, or of the existence of supra-familial sodalities (Newell 1984:74), so we suggest that European society in the Mesolithic was indeed of the family level.

### **Tribal Level Societies<sup>5</sup>**

There is at present little agreement or common understanding concerning the social organization of peoples lacking leadership but constituting social units larger than the nuclear family or camp. This is largely due to the fact of the extinction of societies of this type before and during the 19th century in every area of the world save South America. Another reason for the confusion is probably due to the bewildering number of forms which these societies present to ethnography.

Since we view social complexity as the key factor in measuring social evolution, it is possible to set upper and lower limits to this level of integration. At the lower end of the scale is any society which displays sodalities which consistently integrate families. These sodalities may be lineages, clans, moieties, age sets, or residential associations. By the term 'consistent' is meant that membership in such sodalities is long-term (over several years) and remains a conscious referent in the mind of the actor in so far as providing a blueprint for potential action in situations demanding cooperation in groups greater in size than the family.

At the upper end is the limitation that elements of the political economy be entirely lacking. Leadership in these societies is generally

collective, though it is usually appropriated unequally along sex and age lines; that is, by elder males. Some groups such as Yanomamo and precontact Pomo and Chumash of California may have chiefs or headmen; but these hold influence through consensus, lack the power of force behind their words, and have economic influence only through the efforts of their own family. Social behavior and decision making is regulated by often elaborate ceremonialism.

These societies are also encountered in residential collectives, ranging from seasonal pastoral neighborhoods to seasonally or semi-permanently occupied hamlets or villages. The stability of the residence is due to factors which promote aggregation; such as a stable and productive resource base and permanent water supplies. Factors such as the threat of depredations by raiders may negatively promote aggregation of families for collective defense, or retaliation.

Since one must prove the non-existence of ascriptive rank and the political economy, the identification of the tribal level of socio-cultural integration from archaeological remains is problematic (cf. Binford 1962 for comments on methodology). For example, the case seems well proven with respect to most prehistoric American Anasazi cultures where extensive excavations have failed to demonstrate any evidence for ascriptive status (c.f. Graves et al. 1982; but see Earle 1987:285 on Chaco canyon).

Tentative examples from the prehistory of Europe are to be found in certain relatively sedentary late Mesolithic fishing, hunting, and food collecting communities of the rivers and coasts (e.g. Lepenski Vir, Yugoslavia [Srejovic 1967], Mount Sandal, Northern Ireland [Woodman 1985]), but more strongly in the simple residential aggregations of the Early Neolithic (e.g. Loch Gur, Co. Limerick [Ó Ríordáin 1954]).

The existence of sodalities at present may be inferred indirectly through the evidence of a more elaborate/organized ceremonialism; e.g. the cult of the polished stone axe, shrines and figurines, and a more elaborate burial rite. More directly, the evidence from regions and settlements which demonstrates increased sedentism; including tangible habitation structures, the substantial accumulation of midden deposits, and a more complete range of activities represented in the artifact inventory which point to the origins of village (corporate) life at the, are sure indication of the existence of the tribal level of integration.

### **Segmentary/Big-Man Societies**

In the previous sections societies were considered which largely lacked extended kinship groupings. This section concerns groups where the lineage constitutes an important organizing social principle. The heading conflates what have heretofore been considered distinct forms of social organisation. It is true and important that in many respects big-man sodalities and segmentary societies are distinct. The purpose of bringing them together here is simply to underscore the point that within the different evolutionary trajectories they represent, there exists the initial expression of two very important factors which have a bearing on the evolution of stratified polities: leadership and the political economy.

Segmentary/big-man societies are characterized by lineages which are often linked into confederacies of varying degrees of strength and size; based upon a conscious need to pool for common defense, offense, shared ethnicity, or a history of common origins (Sahlins 1961, 1963; Rappaport

1967). Leadership in societies of this type is in parts hereditary and entrepreneurial. Big-men are leaders of powerful lineages which usually have a history of providing leadership to the larger group. Big-men must, however, show promise for the role and succeed in the series of competitive feasts and confrontations in which they engage, beginning with their early youth.

Competitive feasting is but one aspect of the accumulation of substantial surpluses of food, and the production of goods above the needs of household consumption which marks societies at this level of integration. These surpluses are mobilized for a myriad of ritual and exchange purposes which serve to forge alliances at the individual, lineage, and super-lineage level. It is appropriate at this point to introduce a distinction between the domestic and political economy on the production side. The latter refers to production which is not realized for the consumptive needs of the domestic production unit. The political economy emerges for the first time in segmentary/big-man societies.

Segmentary/big-man societies range from being rather loosely organized, as in the case of pastoral societies of this type, to being intensely interdependent with a relatively permanent decision-making apparatus, as in the example of the Iroquois confederation. This variation in organization should constitute a program for future research.

Segmentary/big-man societies show perhaps the greatest variation in subsistence adaptations. A list would include varying degrees of pastoralism and agro-pastoralism, hunting and gathering (including fishing, shell fish collecting and sea-mammal hunting), paddy agriculture, and horticulture.

In prehistoric Europe, there has been some progress in recognizing this level of sociocultural integration (Renfrew 1979: Chpt. 12, Kristiansen 1982). However, scholars have been reluctant to define clear material correlates for these societies, possibly due to unfamiliarity with the ethnographic literature, but most likely due to a fascination with chiefdoms and "social complexity," and a desire to see both in the meagerest of evidence (e.g. Renfrew 1974; van de Velde 1979; see Habicht-Mauche et al. for a discussion).

To very superficially consider the archaeological evidence, it is possible that segmentary/big-man level societies were present in Europe from the Mesolithic period up to the Iron ages, at which time they persisted in less productive zones. As evidence, one should consider the following material correlates of segmentary/big-man society: a productive economy with perhaps some facilities built with communal labor (such as large boats or fishing weirs). The frequency of recourse to communal labor is expected to vary with the demands of the economic base. One would expect pronounced evidence for communalism in ritual aspects. Ethnographic material examples of this are the prophet's mounds of the Nuer (Evans-Pritchard 1969:186), and the ornately carved houses of the sib and moiety leaders of the Tlingit (Krause 1885:123-131).

On the economic side, evidence must be sought which attests to the presence of the political economy. The political economy in big-man systems manifests itself in the form of the competitive feasting in agricultural and hunter-gatherer communities where it is possible to store foodstuffs. Among pastoralists, though it is weakly developed, indications of a political economy are to be detected in asymmetrical cattle lending arrangements, inequalities in the number of wives among males, the number of cattle given over to sacrifice, and the size of the overall household.



With respect to the identification of archaeological big-man systems, evidence for small scale-accumulations of foodstuffs and material goods would strengthen the case. Specialized craft production cannot be taken to be a universal correlate of this level, but its existence and application to sociotechnic artifacts would strengthen an identification.

The exchange and hoarding of polished stone axes and knives in northern Europe in the Neolithic, and Bronze ages is compelling evidence. Large hollow scrapers, which form a prominent component of burial offerings seem also to fall into this pattern during the Neolithic/Early bronze Age periods. In Ireland, the cairns, portal dolmens, single-inhumation cists, and wedge tombs of the Late Neolithic/Early Bronze ages show the burial of a limited number of adults with status-signifying goods into tombs which required the input of communal labor (Herity and Eogan 1977: Chpt. 4). The prominent location of these tombs at short distances from each other point to the organization of people in small-scale groups.<sup>7</sup> The Irish wedge tombs are rarely separated from each other by distances of more than a mile.

Small scale tombs which are more communal in aspect, such as the chambered tombs of the Orkneys, the gallery graves of Scotland, and the court cairns of Northern Ireland may indicate the existence of societies which have a more strongly organized and promulgated system of leadership which encompasses an extensive network of individuals (It might also mean that the segments are larger, more complex, or simply that burial ritual has changed from the individualized burial of the Early Neolithic. All of these are hypotheses worth testing).

In settlement evidence, communities of the Linearbandkeramik culture of Northern and Central Europe during the 5th millennium B.C. exhibit characteristics strongly analogous to ethnographically known communities of the segmentary level; e.g. the 17th and 18th century A.D. Algonquin speaking communities of the northeastern United States and the 19th century Tlingit of the Pacific Northwest. The village structures of these peoples were distinguished by the existence of large house structures which sheltered entire lineages. By the available evidence, the houses of the sib and moiety leaders were larger and/or more elaborately outfitted (de Laguna 1972:318, 462-3, Krause op. cit., Trigger 1969:60). Linear-bandkeramik communities consist of small hamlets of long houses which have been interpreted as the habitations of extended kin groups. Invariably, one of the houses of the community is significantly larger than the rest and were very likely the habitations of lineage headmen (Bintliff 1984c:86; Luning 1982: 16-18; Milisauskas 1972:70-73; Soudský 1962:197, 1969:93).

## Chieftdoms

The literature on chieftdoms is at this date quite voluminous (cf. Carneiro 1982, Earle 1987 for summaries). Chieftdoms are polities which are constituted of a number of lineages bound together by a knowledge of a shared history of common kinship. One lineage is preeminent within the group by virtue of its position of direct descent to a presumed founding ancestor. This lineage holds title to a permanent office of leadership. All ranking within the society is mediated by genealogical position.

There are a number of other social institutions associated with chieftdom organization. The basic family units are multigenerational and kin terms are usually classificatory. The ancestors of the leading family are quasi-deific, and form the basis of a genealogical cult. The leaders will also form or claim a tie to other supernatural powers that exist

(e.g. the *feis* wedding ritual of inauguration among the Irish). Chieftainship is sacred, and imbued with a sacred power (*nemed* - Ireland, *mana* - polynesia). Relics of past ancestors in the central line are imbued with a potency from this association, and form a focal point for group unity (the various portable shrines of Late Iron Age Ireland).

Chiefdoms are redistributive systems in the sense that chiefs make periodic exactions of goods and foodstuffs from the members of their polities and political subordinates and promulgate their generosity through distributions of food and craft products (Service 1962:144). The point of redistribution, however, goes beyond the reallocation of resources and the provisioning of chiefdom members with craft items. Redistribution is also channeled into the political economy and funds the sumptuary lifestyle of aristocrats, promulgates their rule through the sponsorship of feasting, ritual, and ostentatious display, and funds the expansion of the system through the accumulation of followers (Earle 1978, 1987).

Sahlins' 1958 survey of Polynesian societies demonstrated the range of complexity exhibited by chiefdoms. He was satisfied to lump these societies into a number of groups without generalizing his criteria. Gibson (1982: Chpt. 1) surveyed the range of complexity of Irish chiefdoms, utilizing Sahlins' criteria to array the complexity, each level of complexity termed a "phase." The phase concept utilizes two criteria to distinguish the developmental complexity of chiefdoms; the number of hierarchical levels of authority within a chiefdom, and the ability of the chief to enforce his will; both in the punishment of those who offend him or his subjects, and in the management of food production. Whatever system is used to assess the complexity of chiefdoms, it must be admitted that variation in the complexity of these organizations is great, and must be dealt with if the chiefdom concept is to be used as an analytical unit.

Great strides have been made in understanding the material correlates of chiefdoms. This includes treatment of the dead in burial ritual (Milner 1984; Pebbles & Kus 1977; Sanders 1974), and the settlement system (Earle 1978; Steponaitis 1978). In northern Europe, it is likely that chiefdoms first appeared on the scene in the Late Neolithic, and persisted on in the fringes of the British Isles until the beginning of the 18th century A.D. Van de Velde's arguments for chiefdoms in the society of the Linearbandkeramik societies (1979) of the Early Neolithic of Europe, however, are unconvincing. They are based upon only slight quantitative differences in grave inventories and refer to no realistic model of chiefdom social organization. The settlement clusters, larger, more elaborate houses, and some status items may only indicate a segmentary system with big-men.

The monuments and objects of the Wessex culture, and the large passage graves of Ireland are probably more commensurate with expectations of the scale of chiefdoms. The size of these monuments indicate the coordinated investment of considerable communal labor, and the objects recovered indicate local craft specialization for the intended consumption by a few prominent individuals (e.g. the Wessex gold objects [Taylor 1980:45-9], the mace-heads of Knowth [Eogan 1984; Eogan and Richardson 1982]).

The attestations of chiefdoms in the Bronze Age periods are not as clear. Some of the henge monuments and stone rings may be the products of chiefdoms, indicating as they do the investment of communal labor and involvement in communal ritual. It is likely, however that the landscape of northern Europe was dominated at this time by segmentary societies, with isolated chiefdoms located in zones of greater productivity as in the Late Neolithic (relative to the simple farming technology).

The manufacture of elaborate cast objects of bronze in the Middle and Late Bronze Age periods indicates a thriving trade in the constituents of bronze, and perhaps a greater emphasis on personal display (though it could well also indicate a shifting in display media). The non-use of many of the halberds and axes of the Irish Early Bronze Age indicates the status associations of these objects (Harbison 1969a,b). Their frequent deposition in rivers, lakes, and bogs could also indicate the ritual aspect of display. The appearance of hillforts in the Late Bronze Age period points to a resurgence of the physical manifestation of territoriality. The appearance of massive storage facilities at sites such as Danebury are perhaps the first incontrovertible evidence for chiefdoms in Britain in the Later prehistoric periods (Cunliffe 1983, 1984).

## Primitive States<sup>7</sup>

Whereas people in a chiefdom are bound together through the principle of kinship, this fiction is done away with at the level of the primitive state. The primitive state may have large corporate kin structures, but their political significance is superceded by the office and institutions associated with kingship. The office of kingship is stronger than in complex chiefdoms, with clearer rules of succession (succession is limited to male offspring of the king). There exists a rudimentary, yet permanent bureaucracy of advisors, attendants, and administrators. Sub-chiefdoms as autonomous units cease to exist. Instead one finds territorial sub-divisions administered by appointees of the king. There is always a permanently standing armed following. This may consist of a small force supplemented by levies for military undertakings, or rotating age sets as in Africa.

Food production tends to be regulated directly by appointed managers, though this is not a characteristic of agro-pastoral regimes. Appropriations of food may be both regular and arbitrary. The royal residence is often not geographically fixed. The king moves among his subordinates and requisitions food for himself and his following.

Polanyi characterized the mode of the appropriation of resources in a primitive states as *staple-finance* as a corollary of his principle of redistribution (1968:186-8, 324): Agricultural products and goods with a standardized value are collected from the populace. These staples are the basis of payment in return for services performed to the state (Earle and D'Altroy 1982:266). Johnson and Earle correctly stress that the appropriative behavior of the elites of primitive states differs only in intensity from that of their counterparts in complex chiefdoms (1987:21, 264, 309, 318-20). The stores of produce and livestock are only more massive in scale, and the scale of craft production is greater. We would argue that only critical difference in political economies between these two levels, if indeed one exists, is in the bureaucratization of production; the direct intervention in agricultural and craft production by the elites through managers (ibid:246, 270).

As the transition points between the previously discussed levels of integration would be expected to be somewhat nebulous in the archaeological record, so is it for the complex chiefdom/primitive state formations as well. There are few predictable material correlates of primitive states that differ from those of complex chiefdoms. One would expect the overall scale of the society to be larger in areal extent relative to the resource base. Those resource strategies which support higher numbers with less land; say with wet-irrigated crops, might be associated with smaller polities than would a land-extensive agro-pastoral kingdom.

Most writers on early state formation associate small-scale public works with incipient states. In Mesoamerica this entails ceremonial centers with small temple platforms, elite burials with sumptuary items in the ceremonial sectors with prestige goods (Sanders 1974). In overall consumptive behavior, it would seem likely that the overall differences in the lifestyles of the inhabitants of a kingdoms would exhibit sharper divisions with no consumption of prestige goods at the level of the commoner.

In northern Europe, the bonafide primitive states of the early medieval period (500 - 1000 A.D.) manifest these problems of detection. It is possible to view the imprint of primitive states in the archaeological record of Anglo-Saxon England and of the Germanic kingdoms of the continent. However, one's ability to recognize these traces for what they are is aided immeasurably by textual evidence.

In Saxon England, royal palaces are identifiable by their large size, the presence of a special hall for the meeting of the king and aristocratic council, and features related to state ceremony (cf. Cunliffe 1976, Rahtz 1979). They are distinguished from their Irish counterparts, occupied not by kings, but by paramount chieftains, largely in terms of scale. The scale of Saxon ecclesiastical architecture was also comparable in scale to that of contemporary Ireland. Saxon primitive state differed significantly from Irish complex chiefdom in perhaps two respects detectable archaeologically: 1) the bureaucratization of staple finance through the establishment of storage and collection centers (Hodges 1982:142), and later the organisation of manors. 2) The establishment of purposive communities to consolidate regional hegemony, and to engender and regulate craft production and trade. Into this latter category fall the *buhrs* (Alcock 1972:68, 194-7; Haslam 1984), and emporia (Hodges 1982).

It is probable, however, that emporia are not axiomatic manifestations of state structure as Irish ecclesiastical communities, though perhaps not conscious aristocratic foundations, played a role similar to emporia in Late Iron Age Irish society. The emporia, specialized trading centers on the coastal fringes of kingdoms, are outgrowths of the importance of long-distance exchange to aristocracy as a source of goods and wealth (Hodges 1982). This trade activity was accompanied by coinage, a reflection of the desire to facilitate and promote market-like exchange through the promotion and control of standardized equivalent economic units. In a more abstract sense, this market system leaves its imprint in a dendritic exchange system (Hodges 1982: Chpts. 1 & 2; Smith 1976:34-5).

It is important to note, however, that these institutions will be found in societies only where long distance exchange is important. The social system imprints the system of economic circulation, not the other way around. In the case of the landlocked agro-pastoral kingdoms of Bunyoro and Ankole, long distance exchange was of no importance and there was no market development (Posnansky op. cit.).

In the earlier European periods, one cannot be sure just how far back the primitive state can be extended. It seems highly likely that the oppidum-dominated Celtic societies of the La Tène period were organized into primitive states. This supposition is borne out by the relatively large population concentrations at oppida such as Manching, and their role as foci in long distance exchange systems. It is likely, to judge from statements by J. Caesar that Celtic society in Gaul resembled that of the early Greek states; dominated by councils of aristocrats led by a preeminent ruling family (cf. Crumley 1974).

What then of the Fürstensitze of the Early Iron Age (Hallstatt) period in west-central Europe? The territorial extent and spacing of these sites, the evidence for an associated extra-mural community, quarters for specialized craft specialists, the great amount of labor associated with their construction, the associated temples, the sumptuary nature of the tombs of the aristocrats (Vix, Hochdorf), and the ubiquitous, though not voluminous evidence for long-distance exchange all argue strongly for the attainment of primitive state organization in this period as well (see Arnold, this volume). The primitive state probably waxed and waned in its presence in Northern Europe, with simple and complex chiefdoms persistent on the fringes from c. 800 B.C. to c.1200 A.D.

## Conclusion

The last subject to broach here is the focus of research. Under this paradigm the emphasis is on the identification of the factors which promote, impede, or direct the course of social evolution. Are there differences between chiefdoms of the same order of complexity with differing subsistence base, demographic structure, or opportunities for engaging in specialized craft production or the long-distance exchange of craft or sumptuary goods? How do these factors contribute to differences in the structure of emergent states? Hence, this paradigm, in contradistinction to the Marxist paradigm, does not predicate the factors which promote social change. In other words, this paradigm does not carry the seeds of its own explanation. It does, however, compel those who adapt this paradigm to look to the nature of the relationship between the society, biology, human action, and environment; that is, to the nature of the social adaptation to explain differences in structure and the limitations of a societies' response to the pressures of change (whatever they may be).

## Notes

1. Strangely though, Friedman is at pains to claim a school of evolutionary biology as the source of inspiration for the model (1982: 177-8).
2. As Leslie White once remarked, *Theory of Culture Change* is a collection of papers written by Steward over a period of 20 years and does not form a cohesive body (1957: 540). The adaptation of his principles to the prehistory of Peru dates to a paper he wrote in 1949; probably as an outgrowth of his involvement in the Viru Valley Project. After the publication of *Theory of Culture Change* he recognized as inconsistent and all but repudiated the archaeological evolutionary typology he presented in this instance (Steward 1960: 174).
3. Interestingly enough, Steward also later identified cultural institutions as the focal point of analysis in the study of cultural evolution (Steward and Shimkin 1961:488-490).
4. Steward (1955) and later Service (1962) put forward the construct of the band level of sociocultural integration. This level of socio-cultural integration has been lumped together with the family level after Johnson and Earle (1987) due to a lack of consensus over the constitution of the band, which may more properly approximate the structure of the more amorphous camp (that is, lacking clear lineage structure, see Birdsell 1973).

5. After Service (1962). It is tempting to co-opt Johnson and Earle's (1987) term 'the local group' to describe societies at this level of integration. However, their down-playing of social organization and the inclusion of non-egalitarian societies in this grouping renders this option inappropriate.
6. Impressions from the author's own observations in the Burren, Co. Clare, Ireland, where the preservation of these tombs is very good. Numerous small cairns cluster in areas at a distance from the cairns and wedge tombs. See also Renfrew (1979 op. cit.).
7. After Service (1975).

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## northern and western europe



## AGRO-PASTORALISM AND REGIONAL SOCIAL ORGANISATION IN EARLY IRELAND

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*They are a wild and inhospitable people. They live on beasts only and live like beasts....They use the fields generally as pasture, but pasture in poor condition. Little is cultivated, and even less sown. The fields cultivated are so few because of the neglect of those who should cultivate them.*

Giraldus Cambrensis on the Irish of the late 12th century A.D., 1951 (1185).

### Introduction

That aspect which most distinctly sets humanity apart from other forms of life are the variegated forms which our social organization assumes. Our lives are shaped and played out within the roles which we inherit, transform, or create. The character of each individual society is most explicitly expressed in the configurations of its constituent institutions. Social evolution is in essence the progressive transformative structural changes which social organization undergoes; the dominant trend in human societies is for social structures to become more complex. The work of theorists such as Steward, Polanyi, Barth, and Sahlins has brought home the necessary causal connection between the nature of a society's economic adaptation, the level of the development of political institutions within that society, and the nature of its institutions and instituted behavior. This study at the onset accepts a causal connection between environment, mode of adaptation, and the configurations of that society (see Gibson & Geselowitz, this Volume).

Chiefdom social organization has been a topic which has attracted considerable interest from archaeologists and historians over the past decade (cf. Biddick 1984; Creamer & Haas 1985; Earle 1978, 1987; Hodges 1982; Hudson et al. 1983; Sanders 1974; Steponaitis 1978). This is no doubt due to the fact that states have everywhere been preceded by the prior existence of chiefdoms in their formation. European archaeologists in particular have become increasing aware that chiefdoms must have dominated the social landscape of the Late Neolithic, Bronze, and Iron Ages in Europe (cf. Haselgrove 1982; Kristiansen 1982; Renfrew 1973, 1974, 1979; van de Velde 1979,). However attempts at the reconstruction and



interpretation of prehistoric European social organization have been few, and have proceeded largely from untested assumptions (e.g. the primacy of monumental tombs, hillforts as 'tribal foci', and distinctive patterns of wealth deposition in graves).

The evolutionary successor to the chiefdom, the *primitive state*, exhibits a great deal of structural diversity; running the gamut from northern European feudalism with its indirect, contractual management style, the hydraulic theocratic city states of Mesopotamia, the agrarian (or polycultural?) city states of the Mediterranean, and the direct management policies of the Bantu and Polynesian states.

Given this diversity in primitive state structure, it is reasonable to expect that chiefdoms will also exhibit comparable structural diversity. Sahlins' *Social Stratification in Polynesia* (1958) was important for revealing the diversity in the scale and complexity of chiefdoms exhibited by a single ethnic group with a common historical origin distributed over varied environments (a process termed *adaptive radiation* (cf. Kottack 1980:41-44). Sahlins' study also makes reasonable the expectation that the structure of chiefdoms owes something to the nature of its resource base (Crumley [1979] and Kristiansen [1982] also hold this position). It might also seem to be a reasonable assumption that the variation in the structure of the political systems of primitive states can be traced to the variation in social structure and adaptations exhibited by the chiefdoms which they later superseded. Through a study of variation in the economies and social organization of chiefdoms may we understand the variation in the structure of past, present, and future states.

This study examines the impact that a subsistence economy consisting of a principal dependency on the products of cattle, supplemented by other livestock and limited agriculture has on social organization at the chiefdom level. The case in point described here are the Early Historic/Late Iron Age chiefdoms of Ireland. The analysis of the structure of these chiefdoms proceeds from three independent sets of data: the descriptions of contemporary pastoralist and agro-pastoralist peoples, the contemporary ethnohistoric texts written by the Irish describing their society, and the archaeological record of Late Iron Age Ireland. No unidimensional data set by itself is sufficient to allow for a complete interpretation of the structure of Late Iron Age Irish chiefdoms. When they are compared however, the consistencies in these three sources of information may reveal the principal factors which generated the structure of early Irish society.

## **The Dynamics of Pastoralism and the Theory of Social Evolution**

Marxist ethnographers of pastoralists reject out of hand the potential of pastoralist peoples for independent state evolution (c.f. Burnham 1979; Irons 1979; Kottack 1980; Krader 1979). The mobility of the resource base is cited as the premier inhibiting factor; resources which are mobile are not easily subject to control or appropriation by an external authority. Discussion of this issue often rests upon the critical analyses of historic examples, and not upon the analysis of the concept of pastoralism as a whole. They fail to depict accurately the dynamics of a pastoralist economy and contingent effect of these upon the quality of the social organization of pastoralists and agro-pastoralists.

There are three dimensions to pastoralism which have consequences for management practices and also ultimately for the constitution and dynamics of social units. One dimension is the species of stock raised and their characteristics and requirements. The second dimension is the productive

capacity of the environment with respect to the stock being raised. The third dimension is the degree of dependency upon livestock as a source of food vs a dependency upon agriculture or horticulture. Variation with respect to any one of these dimensions is bound to have a different outcome with respect to the qualitative aspects of a social structure (cf. Rubel 1969).

Variation in the first dimension has consequences for the stability of the food source. Components of this variation are the speed with which stock can be replaced in the event of a disaster, the number of animals in milk, the amount of milk they produce and its nutritional qualities, the speed with which an animal comes into milk, the sensitivity of the species to disease, relative infant mortality, the number of young produced and the spacing of births (Dahl & Hjort 1976). The composition of the herd will also affect the structure of the social group in so far as whether or not small stock are kept which can be managed by women, the ease with which animals of different species can be controlled, and the number of individuals that are necessary to care for a herd of a certain composition and of sufficient size to feed the managing group (cf. Rubel 1969).

To a certain extent there is an interlinkage of the first two dimensions; the different species which are kept for stock have differing levels of tolerance for the fluctuation of environmental parameters e.g. cattle have to be watered fairly frequently (every other day) while camels can easily go over a week between waterings (c.f. Dahl & Hjort 1976; Fratzkin 1986:274). Hence different environmental regimes have different optimums with respect to the kinds and combinations of animals that can be kept.

Optimum combinations of stock aside, however, pastoral habitats differ radically with respect to their stability and capacity for productive intensification. Numerous studies have documented the relative instability of the East African habitats of the Karimojong, Turkana, and Ariaal. Frequent periodic droughts have decimated the cattle herds of these peoples, provoking a diverse array of responses depending upon the severity of the crisis.

It would be wrong to believe that the base productive capacity of each habitat was the same. There is every reason to believe to the contrary that the productive potential of the better watered lands of the historic interlacustrine agro-pastoral primitive states of Banyoro and Ankole exceeded that of the more northerly pastoral societies. The excavated protohistoric center of Bigo, with its extensive and massive earthworks and its associations with the ruling family of the pastoral Abachwezi are an ample attestation of this. It seems clear that stratified, pastorally oriented polities existed in the lake district at least four centuries before European contact (Posnanski 1968, 1969).

The third dimension is likewise cross-cut by considerations of the environment. The degree to which a group depends upon grain or any other vegetable food source is a measure of the potential of their environment for cultivation. Areas of extreme aridity or extreme precipitation or where the potential for damage to crops due to extreme fluctuations in precipitation or pests is high (relative environmental stability) would inhibit the development of this sector. Pastoralists are thought to inhabit areas that are only marginally suitable for cultivation. Conversely, the agreeableness of their lifestyle, lacking as it does the consistent and onerous labor requirements of agriculture may produce a resistance to the adoption of agriculture or the expansion of this sector unless necessity pushes them to do so (Gibson n.d.:15-16).

Few societies are purely pastoral. Most practice some cultivation or obtain vegetable food through exchange or asymmetrical social obligations (cf. Arhem 1985:15-17; Oberg 1978). The term agro-pastoralism has recently come into being to describe societies which though dependent upon pastoral resources for the major share of their nutritional needs, practice cultivation to varying degree (cf. Brandstrom, Hultin, & Lindstrom 1979). The cultivation of food could be reflected in increased sedentarism; some care of the crops being necessary during the growing season. The augmentation of the stability of the food source through cultivation (or exploitation of cultivators), the constancy of required labor inputs, and the capacity of the agricultural sector for expansion bears upon group size, composition, and the distribution of labor roles.

With these dimensions in mind it is appropriate to examine the commonalities in the structure of the household of cattle-pastoralists against the diversity of adaptive strategies exhibited by pastoralists to see if any regularities emerge in the constitution of the household which can be laid to a commonly shared focus of the subsistence economy on cattle raising. The greater objective of this exercise is to establish the kind of household structures one might encounter in a prehistoric context. The constitution of the basic household units, if determined to some extent by the economic adaptation might explain certain unique aspects of the political systems of pastoralists.

Following this, the role of social stratification in agro-pastoralist societies will be examined with a mind to documenting the range of political forms assumable under an pastoralist/agro-pastoralist economic regime. It is hoped that this will elucidate the origins and special character of advanced political institutions amongst pastoralist peoples.

### Household Structure and Settlement in Pastoralist Societies

The most completely studied agro-pastoral societies are to be found in eastern and western sub-saharan Africa. This discussion will be limited to those societies which keep cattle as their principal livestock. Literature on the Karimojong, Maasai, southern Turkana, Nuer, Nkore (Ankole), and Fulani has been surveyed for this section.

The labor requirements of herd management vary with respect to the number of different species that are being kept, the number of individual animals, and the season. The determining role of labor requirements was brought out by McCabe in his study of the herd management practices of the southern Ngisonyoka Turkana herd (1985). All kinds of informal social arrangements are effected to balance the shifting nature of labor demands. Those who need labor take into their households juveniles and young adults who are the offspring of relatives and friends. Those who send children to these have a membership which surpasses their needs for labor. Otherwise households with labor needs will try to join up with more populous households (1985:76-80, 177-191). Michael Quam has described the constitution of the Karimojong ere homestead as consisting of several households and dependent relatives who assist in herd management (1976:36, 54-5). One notes an identical household structure among the Nuer (Evans-Pritchard 1969 [1940]:17, 25, 114).

The low milk yields of East African zebu cattle, the keeping of bullocks, the number of cows who will not be in milk, and the high risks of animal loss to disease, predators, raiders, drought, or parasites necessitate the keeping of large herds to supply a household's needs. It seems logical then that the household must be an extended kin group due to

the labor needs of herding under these conditions, and on account of the risk of loss to individual families (Evans-Pritchard 1940:17, 25, 91). Dyson-Hudson estimates that among the Karimojong, a minimum of 6 herdboys are necessary to maintain the herds sufficient for the support of a moderately prosperous household (1970:107).

All pastoral societies surveyed are also polygamous. Having many wives carries with it the implication also that the pool of potential offspring will also be large. The production of a large number of offspring will be advantageous to a household in increasing its flexibility in coping with fluctuations in labor needs, but is also a source of future instability. An inheritance rule whereby most of the household head's cattle go to the eldest son of the first wife gives rise to the necessity of the borrowing of animals or of the raiding of cattle from neighboring groups by younger sons to gain the necessary number of head to make brideprice and establish a household.

Geographically, with respect to the seasons one finds a dual pattern of dry season dispersion and wet season agglomeration among nomadic cattle pastoralists. The reasons for this are that 1) in the dry season, available forage becomes sparser necessitating that the cattle be driven far afield to browse. This may entail young men travelling alone with the cattle, or a wholesale shifting of the base camp, as among the Ngisokyoka Turkana. At this time of year, homesteads are then scattered thinly across the landscape. Females, the very young, and the old may be left behind in the permanent camp to tend small stock and the gardens. 2) In the wet season, the forage grows up lush, allowing families to congregate at a locale and graze their animals together. Important social and ritual transactions are carried on at this time. Mutual protection against raiders is also cited by the Turkana as a factor for congregating (McCabe 1985:96-99).

From this brief survey it would seem that three characteristics distinguish pastoral households. First, the constitution of pastoral households is flexible; largely dictated by the extent of the holdings in animals. The number of individuals necessary to maintain a herd of sufficient size to sustain a household exceeds the size of a nuclear family. Second, the family structure itself is extensive as an outcome of the high frequency of polygamy. The reasons for this may also lie in the labor need of pastoralist families; the need for a large labor force to manage the herds. The third point is that the physical demands of herding in climates where precipitation is highly seasonal dictates that the constitution of the household should be subject to seasonal fluctuation. Indeed, studying any one settlement in isolation is bound to present a distorted image of pastoralist social organization from a social and geographical perspective.

#### **Pastoralism and Settlement Location**

Western and Dunne describe settlement location selection among the Maasai as an outcome of the consideration of many environmental factors which have a bearing upon the livelihood of their cattle. These are, in rough order of importance, the quality of available grazing land, water, the presence of hazards (disease, predators, landscape features), and factors which might lower milk production such as arduous ascents and cold. In addition to these there are those variables which bear upon human comfort and material needs (1979:92).

The layout of the Maasai homestead also reflects a cattle-based economy; an enclosure to ward off predators and contain cattle at night, a

grazing area immediately surrounding the settlement (olopololi), for the grazing of juvenile animals which may be quite extensive, and an outer zone of further grazing land beyond this (ibid:76-77; Quam 1976:57). The importance of maintaining grazing areas around the homestead for small stock and juvenile animals would seem to promote some degree of settlement segregation.

The settlement structure of pastoralists is everywhere strikingly similar in that households maintained themselves at a distance from others. There were no towns or villages among the Nkore of Uganda. The isolated kraal was characteristic of Nkore society, except where danger from lions was great, occupied by the *ekyika* lineage (Karugire 1971:37-8; Oberg 1970:127). Some of the Nuer occupied seasonal villages, but this was a restriction imposed by their habitat in the wet season when most of the surrounding area was flooded with the exception of isolated ridges. Evans-Pritchard states however:

"In some parts of Nuerland....stretches of higher ground, sometimes several miles in extent, enable the people to build anywhere...and little groups of homesteads are dotted here and there, surrounded, and separated, by their gardens and grazing grounds. Nuer prefer to dwell in this greater privacy and show no inclination for true village life." (1969:64, cf. also 109-111; Jacobs 1965:173; Quam 1976:40-41)

Within complex pastoralist societies one also finds a pattern of settlement dispersion. The Mandari chiefdoms of southern Sudan consisted of three settlement groupings, termed the homestead, hamlet and village by Jean Buxton. Though occupied by a cluster of maternal and affinal relatives and dependents, the individual homestead making up a hamlet were separated by fields, woodland and tall grass (Buxton 1961:41). "A man likes to see his fields spread out around his homestead, and those Mandari who have travelled comment unfavorably on the packed homesteads and well-defined villages of the Tsera and Koegora on the Nile" (Ibid:42). Similarly bands of undeveloped woodlands separate the hamlets of a village, and miles of woodland are maintained as a buffer between individual chiefdoms.

The semi-nomadic bahima pastoralists of the Ankole state were likewise dispersed across the landscape (Kreuer 1979:32-5). The paramount chieftain of the Ankole in nineteenth-century Uganda occupied a residence which was in essence a single immense household, surrounded by the temporary habitations of courtiers and attendants (Oberg 1940:136-40).

From a consideration of these factors then, one would expect settlement segregation to be the rule among pastoralists. Two variables mitigate this norm however. Among the Turkana it has been observed that an entire *adakar* (wet season settlement agglomeration) came together and built a common enclosure, under the leadership of an *emuron*, or prophet, a war leader, and an orator (McCabe 1985:97-98). Also Pastoralists who occupy an extremely arid environment, such as the Ariaal, will congregate near a permanent source of water (Fratkin 1986:279). Thus coordinated raiding and resource scarcity may promote fleeting examples of settlement nucleation.

Villages are also to be found among some Fulani groups. These would seem, however, to be the outgrowth of expropriative behavior. These villages are found along better watered areas of Niger and are primarily agricultural settlements. These are an historic outgrowth whereby the Fulani managed or dominated farms worked by slaves and clients (Wilson 1984). These agro-pastoral Fulani continued to keep cattle, which were grazed by herdsmen away from the settlements.

## Suprafamilial Social Organization and Social Stratification

Despite a certain proclivity by some scholars to stereotype pastoral societies as mobile and egalitarian (cf. Evans-Pritchard 1969; Kottack 1980:81-6; Schneider 1979), recent scholarship has suggested the opposite to be a truer picture (cf. Konczacki 1978; Sutter 1987). All pastoral and agro-pastoral societies have some form of suprafamilial and often supra-local political structure, and all are marked by some form of social inequality.

The segmentary structure of the Nuer, Luo, and Dinka is already well known. The cattle keeping southern Turkana congregate into seasonal multi-family associations. These in turn are combined into sections which define access to grazing lands. These sectional divisions can have a profound significance in light of the widely fluctuating shifts in forage availability due to factors of climate and relations with groups adjacent to the section's territories (McCabe 1985:96-106).

The forms of suprafamilial leadership found among pastoralists with a segmentary organization are varied, but would seem to fall into four major overlapping classes: elders, the charismatic, the wealthy, and war leaders.

Livestock are discrete and concrete items of wealth. Though they form the basis for an active exchange, the risks inherent in the keeping of livestock (disease, drought, attack from raiders), and the asymmetrical outcome of inheritance rules insures that there will be wide differences in the amount of stock possessed by any head of household. Those who are wealthy in pastoral communities are tied into a larger network of kinsmen by virtue of multiple marriages and marriages into large kin groups (Dyson-Hudson 1966:84-6). The households of those with large herds are also larger, as they attract needy relatives and non-related dependents to care for their larger herds (Dyson-Hudson 1966:84-6; Evans-Pritchard 1969:179). Young men also turn to them more frequently for bridewealth loans, which also engenders obligations of reciprocity.

Their wealth, the greater number of dependents, and their larger network of social relations gives their voice more weight in the community. Among the Nuer, these wealthy individuals are known as the *gaat twot*, or 'bulls' (Evans-Pritchard 1969:179-80), among the Karimojong they are the *ngikaburak* (Dyson-Hudson 1966:222). The institutional/contractual form which these obligations assume in more steeply stratified contexts, that is, clientship, is exhibited among the agro-pastoralist Mandari, Fulani, and Nkore (Buxton 1967; Karugire 1971:64-6; Oberg 1970:128-9; Wilson 1984).

Formal or informal councils of elders form the decision making party in the regulation of disputes in the community and in disputes between communities among the Nuer, Maasai, Turkana, and Karimojong. This is a product of the age-grade system together with the fact that these men are invariably heads of households and therefore the principal stock owners in the community.

The intensity of aggressive military behavior varies among pastoralists. Most frequently pastoralists carry out sporadic raids to obtain or increase their herds, and also to obtain women. Raids can be sporadic or protracted, depending on the need for cattle, the scale of the societies involved, and the surmised weakness of the opponent to defend his herds. Raids can occur between all levels of the segments of the social order, depending upon the urgency of the need for cattle.

Leadership for individual raids can be assumed by almost anyone, though among the Nuer the *dil* aristocrats seem to have played prominent roles (Evans-Pritchard 1969:177, 180-1). However, specialized coordinators of military activity exist in all segmentary African pastoralist societies who may promote raiding, though they are most prominent in protracted raiding and organized warfare. They are termed prophets in the literature, and their leadership is rooted in clairvoyance and their special relationship with the supernatural (Dyson-Hudson 1966:224-6; Evans-Pritchard 1969:184-9, 1970:294; McCabe 1985:98).

The Mandari of southern Sudan provide a good model of an agro-pastoral chiefdom (Buxton 1966). The constitution of Mandari chiefdoms varied, but in the main, they consisted of a dominant, or 'landowning' clan of on average 8 to 10 generations in genealogical depth. This clan was composed of a number of lineages, which are in turn made up of extended families or sub-lineages. A lineage will range in size from 15 to 50 adult males. Aside from the landowning clan, often other intrusive or non-related clans are found within Mandari chiefdoms (Buxton 1966: Chpt. 5).

Chiefship among the Mandari was inherited by males in the senior lineage who were most often sons of chiefs. A son was chosen for office who was deemed most suitable in character and abilities. Chiefs presided over an assembly of elders. They accepted the destitute as clients and armed bands of personal retainers could back their word. The young men of the chiefdom worked their fields, and chiefs received gifts from economic activities carried out in their chiefdom. Prestige was won through generosity, and they engaged in competitive gift-giving with other chiefs (Ibid: Chpts. 6 & 7).

Primitive states existed historically among the interlacustrine pastoral kingdoms and in West Africa (Bunyoro, Ankole, the Fulani). The political economy was financed by obligatory presents to elites, through patron-client relationships between elites and the less fortunate pastoralists, and through extractions of food and labor from agriculturalists in the lacustrine state polities, which were dominated by force. The historic Fulani polities intensified this latter relationship to the point of bondage, enslaving the agriculturalists they conquered.

The Nkore (Ankole) pastoral state was ruled by a king who appointed administrators to govern sections of the polity. The residences of these officials became geographically fixed to a greater degree than those of the pastoral population at large. Surrounding the king were a number of advisors and adjudicators, and his household was maintained by specialized craftsmen, slaves and servants. The royal establishment was financed by the obligatory contributions from the king's clients, gifts from pastoralists to the king to establish themselves in his favor, and tribute levied upon the agriculturalists. In Ankole, the king maintained a following of hand chosen young warriors, and age sets provided a rotating standing army of young warriors which were posted on the frontiers (Karugire 1971; Oberg 1970).

## Summary

The preceding discussion has teased out of the ethnographic literature on cattle-pastoralists a number of points on the social organization of these societies which will be examined against textual and archaeological material from Late Iron Age Ireland. Due to the requirements of herd management, the basic householding unit is an extended, often polygynous social unit with flexible membership. This flexibility is directly related to differences in herd size and composition, and to the

seasonal movements of cattle. Further, the size and stability of the household may be correlated with the general level of socio-cultural complexity of the larger group.

For reasons of herd management and coordination, that is, to lessen potential conflicts arising from damage caused by trespassing animals to property, and to more easily utilize grazing lands the geographical distribution of pastoral homesteads tends to dispersion. This tendency manifests itself at all levels of social complexity; no towns in the agrarian sense of the word are associated with chiefly or royal residences.

Despite appearances of egalitarianism and social/geographical fluidity all pastoral societies exhibit some form of supra-local organization, wealth differences, and social inequality. At the level of segmentary societies, social inequality is expressed in wealth and age differences. War leadership roles also exist, and are often found to be tied to social prominence through economic success.

On a more general, theoretical level, societies such as the Karamojong and Nuer should be considered equivalent in social complexity to the 'big man' systems of Melanesia and the indigenous eighteenth and nineteenth century societies of the Pacific Northwest Coast of North America. There are three criteria by which they may be judged to be equivalent. 1) These societies are distinguished by the existence of supra-local social units which are mobilized for ritual and warfare. 2) Individuals of higher social distinction exist within these groups who attain their position through birth in a larger, wealthier, or more distinguished kin grouping (as in the case of the *dil* Nuer clan aristocrat), and through the possession of special skills. 3) Wealth differences are important and are used to heighten social status. One can ascribe the birth of the political economy to these societies. Potlatch-type competition for social status is absent among pastoralists, but prestige-heightening donations of cattle in public sacrifice (Dyson-Hudson 1966:86), and the function of wealth in attracting dependents and expanding the kin network stands as the pastoral analog.

Otherwise, the entire gamut of socio-political forms can be found among pastoral societies. This point will be further strengthened below in the analysis of early historic Irish social institutions. There is no reason to doubt that pastoral societies were capable of achieving a great measure of social complexity, and that the factors promoting social evolution should be sought within, as well as without the social system.

## Irish Social Organization and Ecology from the Ethnohistoric Sources

The principal sources for the ethnohistory of the period 700-1200 A.D. are the legal texts known collectively as the 'Brehon Laws'. The texts and their glosses range widely in date, but the oldest strata of the most relevant texts were probably committed to writing in the 8th century A.D. Among this diverse body of literature are to be found tracts such as the *Senchus Mór*, *Uraicecht Becc*, and *Crith Gablach* which define the overall structure of the society and encode the rights and obligations of individual members of different social standing.

### Ecology

As the initial quote from Giraldus Cambrensis illustrates, cattle production was and is today the principal focus of the agricultural economy. The reasons for this lie in Ireland's position in the high



northern latitudes. It is the first body of land to intercept rain fronts that sweep off the north Atlantic. The warm northward flowing current that brushes its shores ensures mild, for the most part snowless winters. Consequently, the weather is too moist and much of the land too water-saturated for a heavy dependence on grain agriculture. However year-round grass production suits the country well for livestock production.

The pastoral orientation of the economy of Late Iron Age Ireland is also borne out by both textual and archaeological evidence. The law texts provide great detail on property ownership and the tributes arising from the clientship system, and in all dealings the principal units of transaction were cattle. This impression gained from the texts is reinforced by comments made by the earliest foreign travelers in Ireland (e.g. Giraldus Cambrensis), and by the dietary data yielded by excavation. Irish sites of the Late Iron Age typically yield few quern stones and great numbers of animal bones, the bones of cattle predominating.

*Social Organization*

The primary social unit in 8th century Ireland was the *derbfine*, an extended family tracing descent through the male line to a common great-grandfather. Property in stock was controlled in common by this group. There was however a somewhat distinct unit recognized within this group,

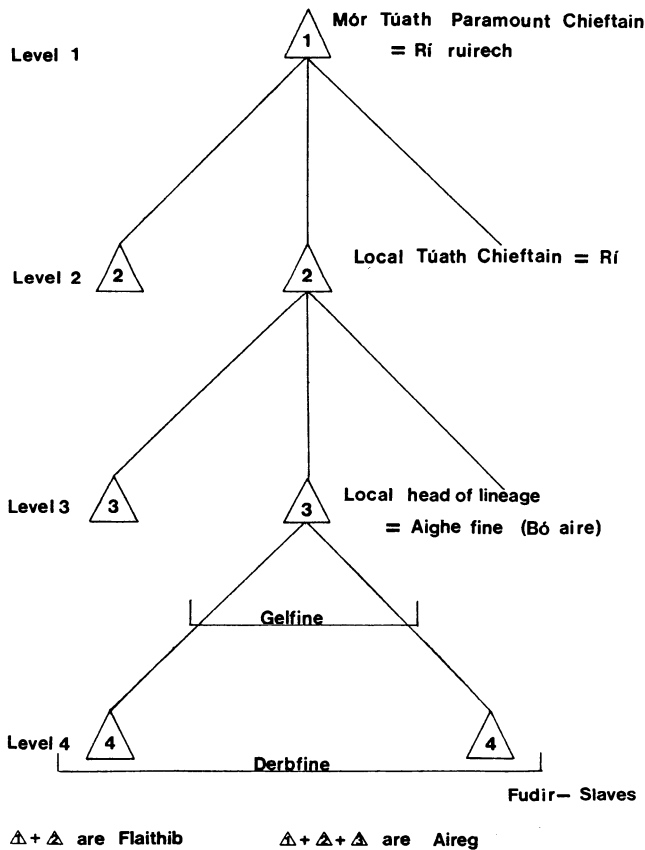


Figure 1. Diagram showing the various nested social levels within an idealized 9th century Irish chieftom.

the *gelfine*. This was probably the minimal lineage which provided to the *derbfine* unit (most likely that of aristocratic families) present and future leadership.

Within a chiefdom individual *derbfine* claimed common descent and recognized the primacy of a single *derbfine* which was said to stand in a relationship of direct descent to the group as a whole. This larger unit was called a *túath*. This is the organization of a chiefdom at the most basic level. The structure described here is perfectly analogous to the *ramage* organization described by Raymond Firth for Tikopia (later termed the conical clan by Kirchhoff [1955]), and discussed at length by Sahlins for Polynesia [Firth 1936; Sahlins 1958]. Indeed, this can be said to be the universal structure for all chiefdoms.

It was common in Ireland for individual chiefdoms to be grouped together into larger composite chiefdoms, called '*mór túatha*' (great *túatha*), either by virtue of claimed common descent or by military domination of one chiefdom by another. The leader of the dominant *derbfine* within the dominant *túath* would then be a paramount chieftain. Within an Irish polity there may be as many as 4 stratified levels of leadership, consisting of the head of a *derbfine*, the head of the *túath* chiefdom, supplanted by the head of a composite chiefdom, dominated by the paramount chiefdom of a more powerful *mór túath* (see Fig. 1).

### *Social Ranking*

Wealth in Ireland was assessed four ways; by the possession of material goods, by the possession of specialized skills, by the possession of livestock, and most importantly, by the acquisition of clients.

The clientship obligation was contracted by the bestowal of gifts and stock by the patron to the client. In return for the receipt of the investment, the client was obligated to make periodic renderings of calves born of the stock, along with milk and other agricultural products. The severity of the obligations depended upon the status of the receiver, increasing for those of lesser status.

Law texts such as the *Crith Gablach* (MacNeill 1923) and *Senchus Mór* (Ancient Laws and Institutions of Ireland, vol. I) portray the linear relationship that existed between one's honor price (the measure of individual status) and the possession of these things. Productive capital in the form of clientship obligations are systematically given prominence in all texts. For example in the *Crith Gablach* the person occupying the status of *bóaire* excelling *bóairig*.....

".....withdraws somewhat from the position of *bóaire* in order to lend capital to clients. The surplus of his cattle, of his cows, his sheep, that his own land cannot bear and that he cannot sell for land.....he gives in capital to acquire clients." (CG, MacNeill 1923:293).

It also seems clear that the recruitment of clients was the exclusive preserve of the aristocracy. Indeed, an entire class of clients, the *saer ceili*, consisted of those individuals who were involuntarily obliged to accept this status with respect to their political superiors, even though they may have been lineage leaders or subordinate aristocracy (Gibson 1982:60-70, see Figure 2).

The ethnohistoric sources offer up a description of chiefdom social organization which can be said to be universal. Structurally, the Irish chiefdoms would seem to resemble the most steeply stratified of the

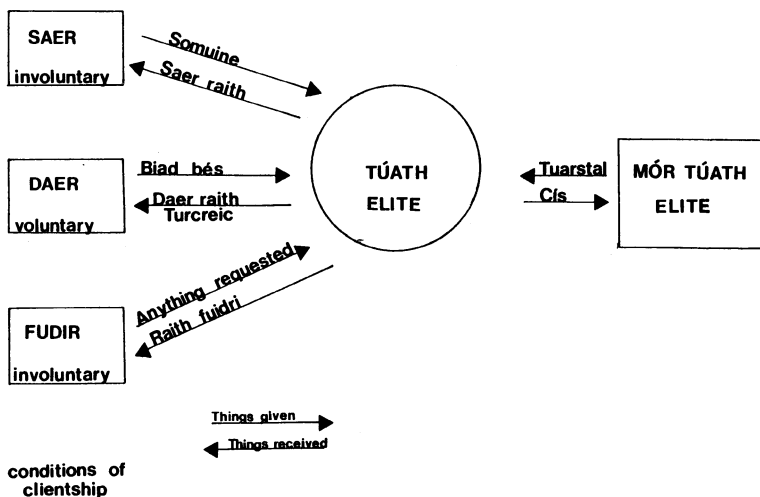


Figure 2. Patron-client statuses as represented by the Irish law texts. *Raith* refers to the capital paid to the client. *Somuine*, *biad*, and *bes* are the types of payments made by the different kinds of clients to a patron. *Tuarstal* and *cís* are exchanged between subordinate and superior aristocracy.

polynesian chiefdoms. Yet on the face of it, the Irish polities were supported by a agro-pastoral subsistence economy which has been argued to be inimical to the autochthonous evolution of complex polities. However, the independence of the evolution of complex polities in Ireland must be accepted as no agrarian states impinged upon Irish chiefdoms. This case generated by ethnohistory is further strengthened by a consideration of the archaeological record of the Late Iron Age.

### The Irish Archaeological Record of the Late Iron Age

A consideration of the Irish ethnohistoric sources allows a number of assumptions to be made which can be retroactively examined in the archaeological record of Ireland. We may infer from the early written sources that complex chiefdoms existed in Late Iron Age Ireland. It remains to be discovered how they appear on the ground.

This poses a challenge on a methodological and conceptual level. On one hand, geographical techniques must be developed to recover the structure of a regional polity. On the other hand, the discovery process must be guided by hypotheses informed by a unified theory of social evolution and human behavior. The hypotheses would concern the behavioral/ecological factors which govern the location of settlements within a chiefdom of a certain scale, inhabited by deceased actors who possessed a certain technology, and who exploited a certain environment with its inherent constraints and potential.

### Settlement and Social Stratification in Early Ireland

Ireland possesses probably the best preserved archaeological record in Europe. For the Late Iron Age, excavation work carried out over the past century has revealed a diverse array of sites; ranging from caves and

shell middens to monastic enclosures and the residences of paramount chieftains.

In order to be able to compare Irish social organization with comparable societies elsewhere, we need techniques to determine the level of sociocultural complexity from archaeological remains. One approach is to examine tendencies in behavior related to the consumption and production of craft products. The hypothesis which guides this approach is that some measure of diversity in site size and morphology is correlated with the status of the occupants, and that these status differences will be reflected in differences in the production and consumption of crafts. The results of such an analysis should serve as an index of overall social complexity in Late Iron Age Ireland.

A contingency table examination of all known excavated examples was carried out by the author in 1982. This study compared domestic habitation sites on the basis of size (overall diameter of the enclosure) and site-type with the variety and number of craft goods found on these sites. Though the diversity of craft goods encountered on Irish sites of this period is great, the analysis was restricted to objects of glass, iron, bronze (Gibson 1982: Chpt. 5).

The data-base consists of 86 published sites excavated over the last 90 years (the period of consistent reporting).<sup>1</sup> These sites were seriated into the two major periods and 6 subphases of the Iron Ages (see Table 1, and Gibson 1982: Chpt. 2). For this study, only sites of Iron Age II attribution were considered. The time span covered by these sites stretches over 700 years. It is nearly certain that changes in preferences for artifacts of certain classes occur over this span (i.e. glass beads probably went out of use after 1000 A.D.). However, these fluctuations diminish only slightly the robust trends exhibited by the data.

The craft goods chosen for study were selected for two qualities; their relative durability (especially pronounced in the case of glass beads) and their suspected status associations. The association of bronze with high status is indicated by an examination of the ethnohistoric literature (Gibson 1982: Chpt. 4).

The distribution of site types displayed in the graphs (Figures 3-6) represents, with the exception of promontory forts, the most numerous types of sites reported in the literature (see Table 2). Briefly, houses (H) are unenclosed domestic habitation structures. Rathes (R) are homesteads encircled with a bank and ditch. Two very large sites of this category are the known residences of paramount chieftains.<sup>2</sup> Cashels (Ca) are analogous to raths, except that they are encircled by a wall of stone.

Table 1. Time periods and phases of the Irish Iron Ages (after Scott 1976)

<u>Period/Phase</u>	
Iron Age I	200 B.C. - 200 A.D.
Iron Age IIa	200 A.D. - 600 A.D.
Iron Age IIb	600 A.D. - 800 A.D.
Iron Age IIc (Period of Viking Influence)	800 A.D. - 1000 A.D.
Iron Age IId	1000 A.D. - 1170 A.D.

Table 2. Breakdown of site sample

Raths (R)	46
Houses (H)	11
Cashels (Ca)	8
Crannogs (Cr)	8
Monastic Sites (MS)	7
Promontory Forts (PF)	2
Specialist Centers	2
Caves	2
Total	86

The excavated ecclesiastical sites were the foci of monastic settlements (MS), and range from the very important sites of Armagh, Moyvilla, and Nendrum to the smaller eremitic communities of the West. Promontory forts (PF) are spits of land jutting out into the sea which have access restricted by a wall or bank and ditch. Crannogs (Cr) are artificial islands set in shallow lakes or marshes usually surrounded by a palisade.

The consumption pattern of each craft product was assessed by comparing the proportion of sites of each class yielding quantities of these crafts ranging from 0 to 15. This procedure compensates somewhat for differences in the proportion of the area investigated between sites, and differences in the numbers of each site type represented.

Though patterns of consumption vary by craft class (reflecting, no doubt change in consumption and production patterns over time, the differing value each product was held by the consumers, and the differing extent of the distribution networks for the different goods), an overall three-tiered pattern of stratification emerges from the data. The monastic sites, promontory forts, cashels, and crannogs cluster together at the upper range of consumption. Rathes occupy an intermediate position, and the houses segregate at the lowest end of the scale; consistently yielding few or no craft goods. This pattern is more clearly expressed by Figure 5, which averages together the scores on the scales of consumption across the three different craft classes for each site type.

When the production aspect is considered, the same pattern emerges. Figure 6 shows the proportion of each site class which has yielded the remains of 2 crucibles which were used in the production of bronze. A comparative examination of the kinds of craft production carried out on Late Iron Age sites demonstrated further that it was possible to distinguish the seats of paramount chieftains. On these sites only could the activities of artificers be detected (Gibson 1982:275-82). Artificers are craftsmen who have the skills to combine several of the elite media (bronze, silver, gold, enamel, glass) into single objects corresponding to Dalton's class of *primitive valuables* (Dalton 1977).

This examination of craft production and consumption has revealed a social hierarchy of at least four tiers. At the lowest end are unenclosed houses and caves (not discussed). Ranked above these are the rath home-steads. The spectrum of elite sites includes crannogs, cashels, and monastic establishments. Historic evidence has aided in the identification of some of the residences of paramount chieftains, and these are distinguished by craft production and consumption on a massive scale, and by the occurrence of a special class of production activity.<sup>3</sup> This spectrum matches well the model of Irish social structure projected by the ethnohistoric sources.

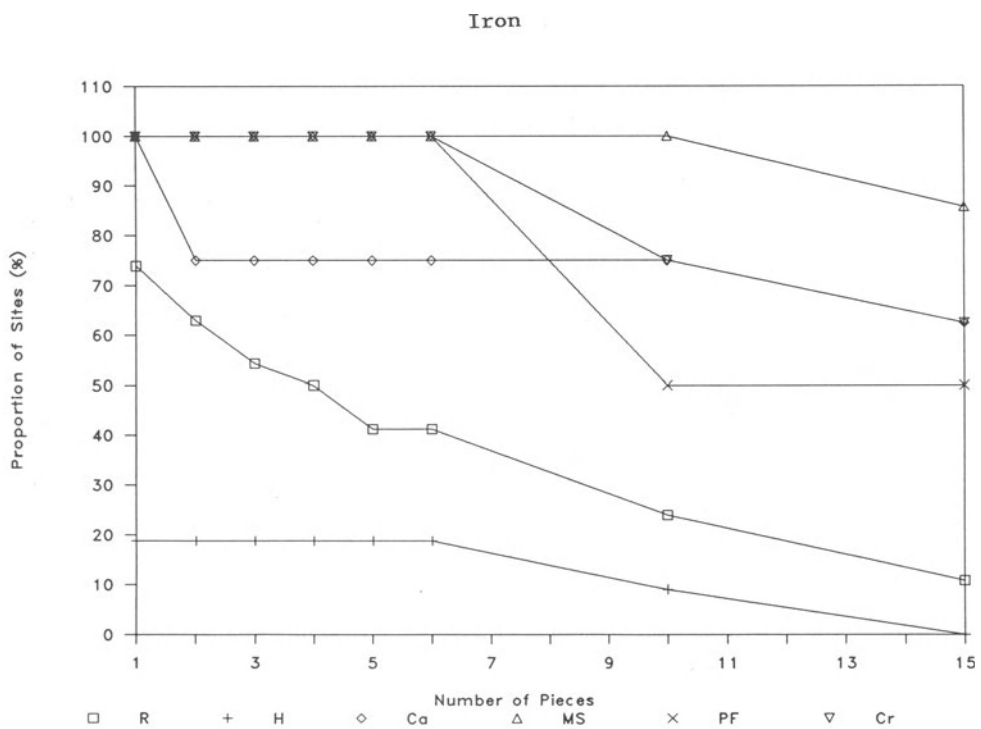
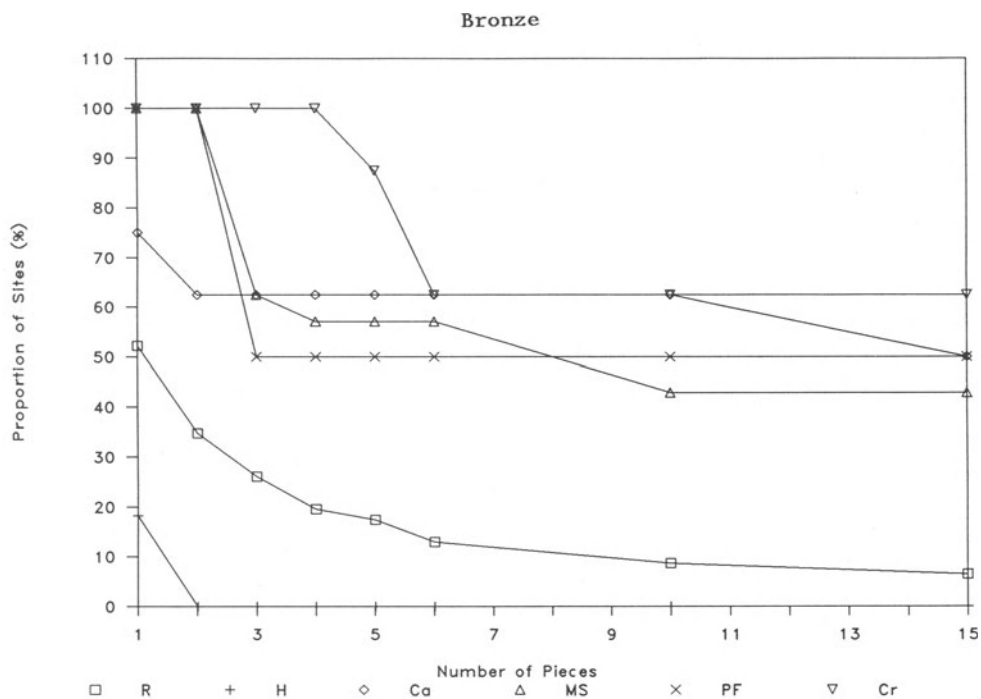


Figure 3.

# Glass Bead Consumption by Site

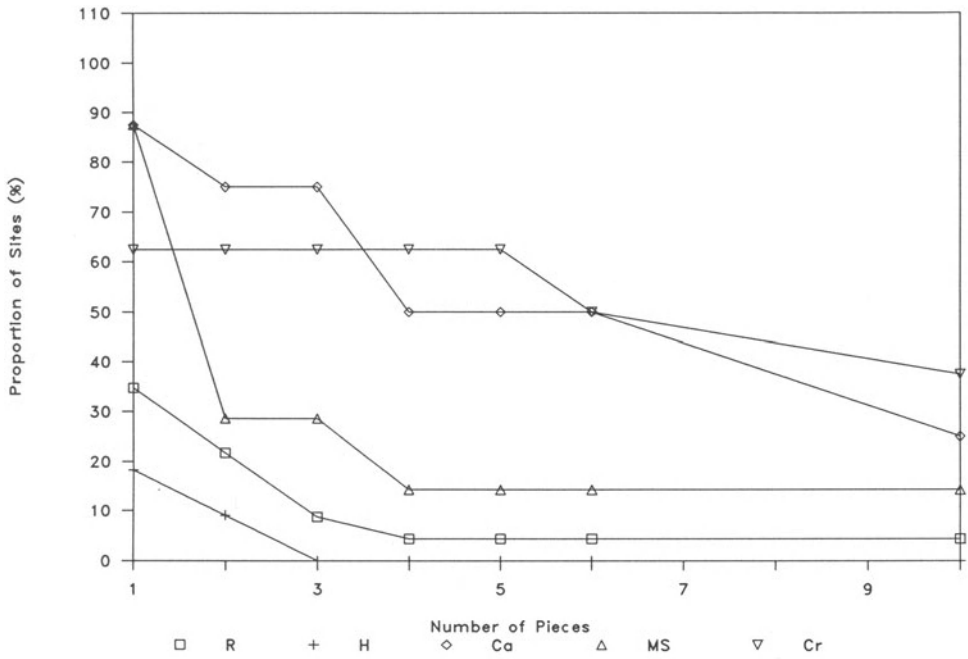


Figure 4.

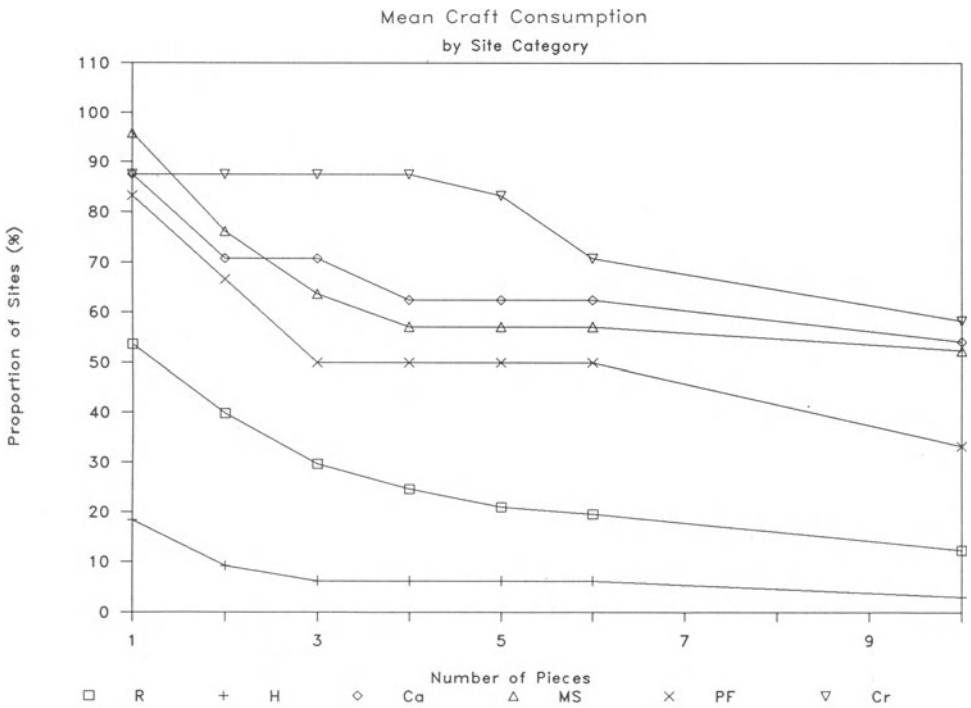


Figure 5.

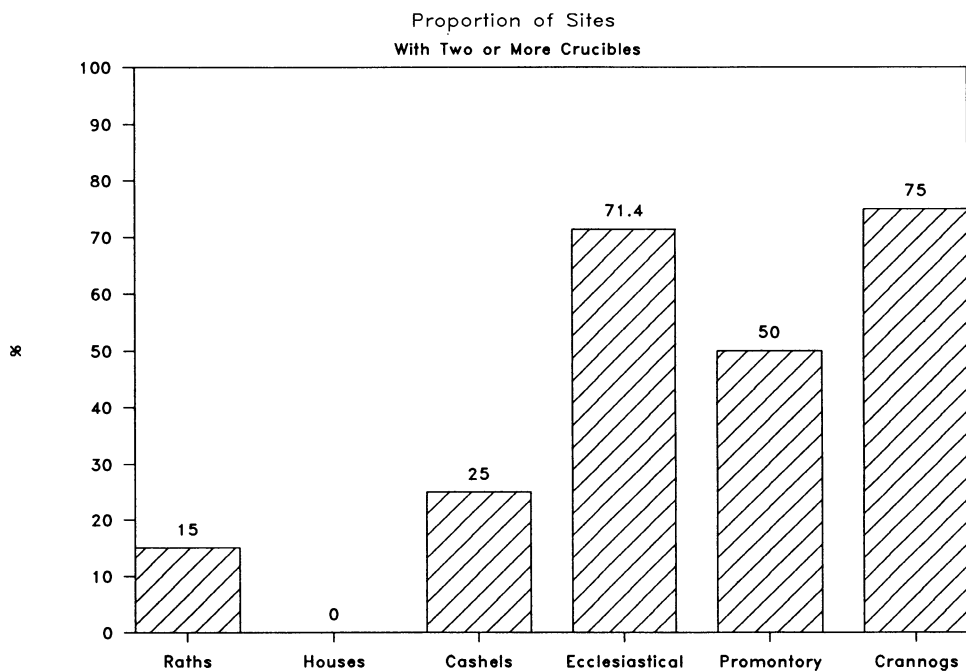


Figure 6. Proportion of sites with two or more crucibles.

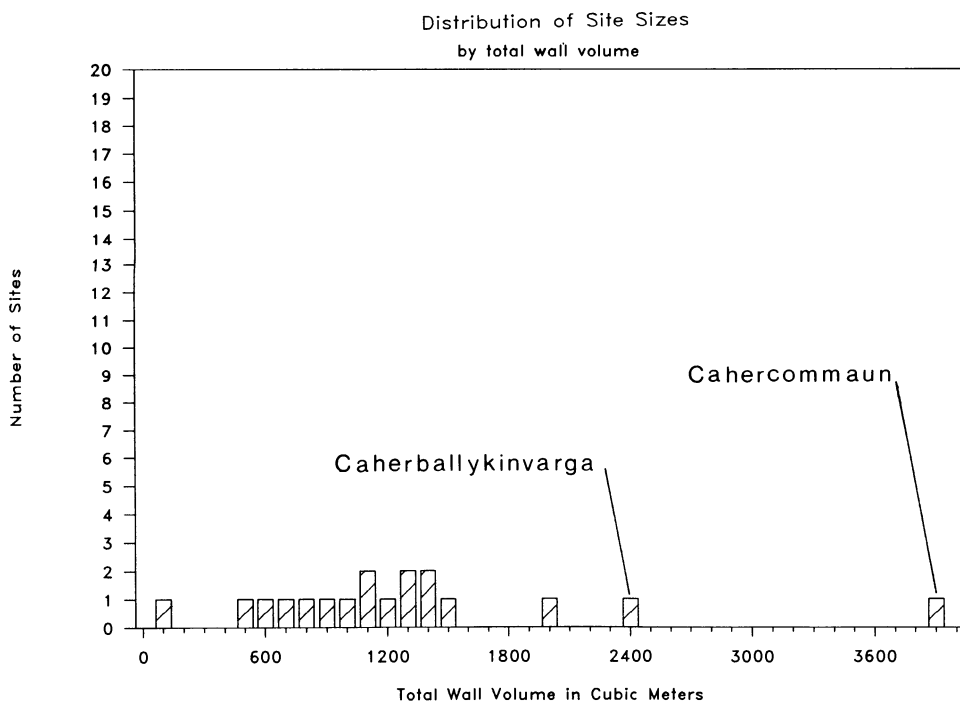


Figure 7. Distribution of site sizes by total wall volume.



This evidence would prove even more compelling if a single chiefdom could be studied. The Burren region of Co. Clare was chosen for a study of this nature. Due to its rugged, hilly nature and the relatively thin soil cover the prehistoric settlement record has been relatively little disturbed by historic clearance activities, except for the past 20 years. The region exhibits a record of near continuous occupation over a span of 6000 years. The most typical sites of the Late Iron Age are cashels, with walls of blocks hewn from the local limestone.

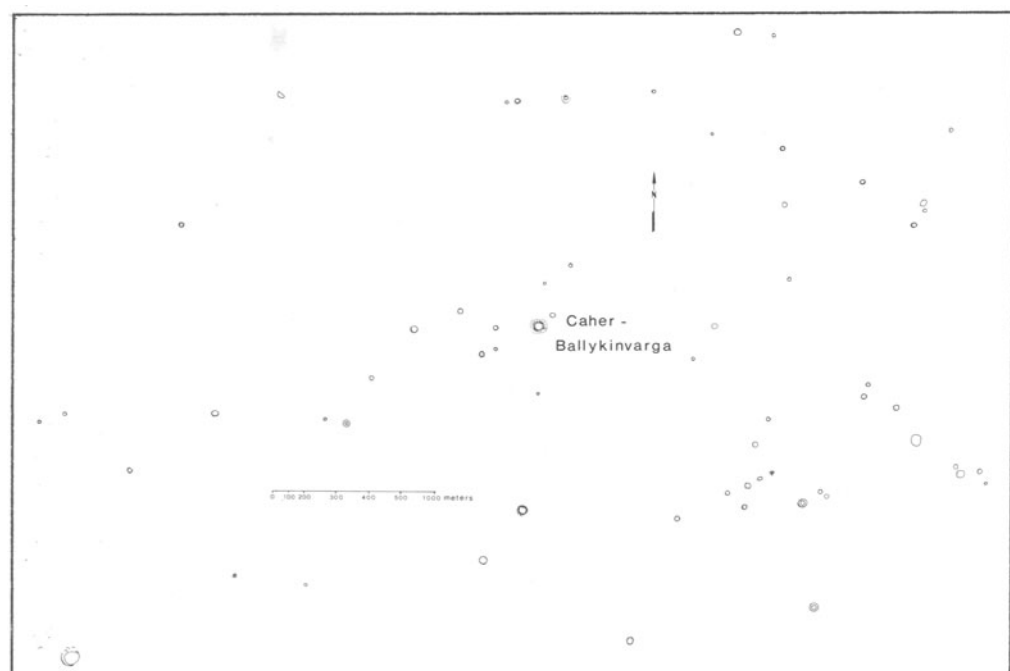
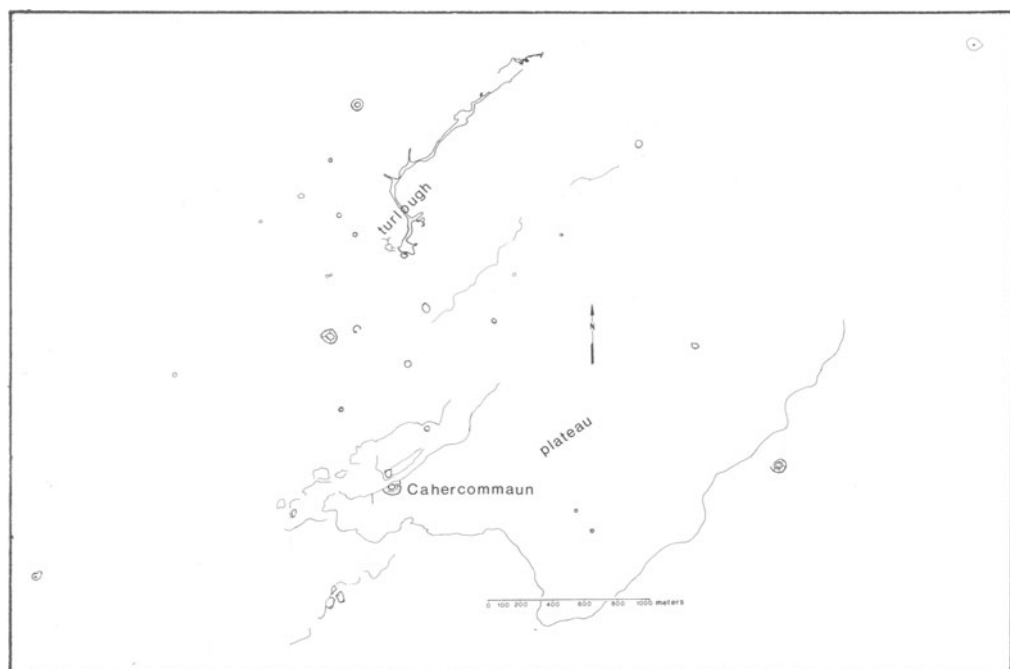
The project has focused upon the eastern half of the Burren, centered upon the large (by Irish standards) tri-vallate cashel settlement of Cahercommaun, excavated by Hugh O'Neill Hencken in 1934 (Hencken 1938). This sub-region was purposely chosen to take advantage of the fact of this site already having been excavated. Hencken considered this site to be an elite residence by reason of its size and the large number of finds that it produced (1938:1-3). A comparison of the volume of material in the walls of all the larger sites in the Eastern Burren bears out the fact of its exceptional size (Figure 7).

Historically, the region was occupied by a people of the so-called *Erain* type. These groups are designated in the early historic references by names which have a totemic quality rather than referring to a founding ancestor, and which for the most part occupied marginal areas on the sea coasts. The particular group in the Burren was called the *Corcu mRuad*, or 'red seed'. In later references (post 9th century) to the area several groups bearing personal names emerge, though little is known of their constitution.

The region is also characterized by relatively high precipitation and a low evaporation rate. A land use survey carried out by the project and discussion with informants revealed that little grain is grown in the region at present and historically. The principal grain-growing areas at present lie on the coastal terraces and in the lower reaches of coastal valleys. At present the local farmers in the upland areas in the core region practice a localized transhumance, grazing their cattle in the valley bottoms in the summer, and sending them into the hills in the wetter winter to take advantage of increased grass production then.

These data gained through the survey strengthen the impression as to the pastoral character of Late Iron Age settlement. The excavation of the settlement of Cahercommaun produced 12 tons of cattle bone, but only 2 whole stones and 33 fragments of rotary querns, in addition to six saddle querns (Hencken 1938:60). There are no rivers of any consequence in the Burren that could power a mill, so unless grain was ground elsewhere and imported to the site, it would seem to have been of secondary importance to the Cahercommaun's inhabitants.

Most of the seriation analysis remains to be performed upon the settlement data. At this stage one can only say that regardless of chronological position within the Late Iron Age, the distribution pattern of the sites conforms to the model of pastoral settlement developed above. Only loose aggregations of enclosures are discernable; notably around the largest settlements in the region (see Figure 8). The size of these sites and the amount of stone in their wall would seem to indicate that they were inhabited by extended kin units.



**Figure 8.** Distribution of cashel and rath sites around the prehistoric centers of Cahercommaun and Caherballykinvarga in the Burren region of Co. Clare, Ireland.

## Conclusions

The purpose of this study has been to examine the factors which may have had a determinative input with regard to the structure of the social organization and political institutions of pastoral societies. It has been argued that there is a causal link between specific resource bases, the extractive technology, and the kinds of institutions which may be expected to evolve. Specifically, the focus has been to retroactively predict how an agro-pastoralist adaptation would structure settlement behavior of an Irish chiefdom.

The law texts and other ethnohistoric sources demonstrate the reality of complex, stratified Irish chiefdoms but give little indication of either the variation in polity structure across Ireland at any time, nor the real social constitution of the Irish stone or earth enclosure (rath or cashel, generically *caher*). Through a consideration of the literature on contemporary pastoralist and agro-pastoralist societies, taken together with the productive potential of an Irish habitat and the distribution of critical resources we may develop some hypotheses as to the demographic structure of Early Historic Irish polities.

Contrary to the aridity of most African pastoralist habitats Ireland is an extremely wet country. The consequence for agricultural production is, however, the same. The country is largely marginal for cereal cultivation as much of the soil is too water-saturated and leached of its mineral content.

The dampness of Ireland does, however, differently affect the production of livestock. Ubiquitous sources of water and a comparatively plentiful, ever-growing source of browse is conducive to the keeping of greater densities of stock and more sedentary settlement. The substantial nature of Late Iron Age enclosed settlements bears testimony to this fact. The labor inputs for the construction of even a medium-sized cashel would be substantial, and signify an intention to stay put.

The configurations of the modal domestic settlement and their resemblance to similar African homesteads can be likewise ascribed to the primacy of cattle herding in Irish society. These enclosures provided security for both human and beast from human and animal predator.

The data from Africa go farther to suggest strongly that the residential unit of the protohistoric Irish homestead was some sort of extensive, perhaps multifamilial grouping. This conclusion is borne out by the known existence of polygyny in early Ireland, the labor requirements of cattle raising, and the substantial size of the average homestead.

Within the gamut of pastoralist adaptations, the greater resource stability that agro-pastoralism affords over more specialized pastoralism may be expected to result in larger and more stable residential units. This may explain why lineages rather than families were the basic domestic units of Late Iron Age Ireland and among the bahima of the Ankole kingdom.

Three factors seem to have been at work in the generation of Irish polity structure: agro-pastoralism, social stratification, and violence between polities. These three factors can in turn be reduced to the constraints which produced an agro-pastoral adaptation, its productive potential, the inherent risks (or 'stability') of this adaptation, and the allowable population densities under these parameters.

The relative stability of the environment and its productivity suggests the probability of relatively high population densities in LIA Ireland, compared to the population densities of sub-Saharan pastoralist groups. At this point, only indirect evidence can be offered in the form of cattle plagues and famines which occurred with great frequency beginning in the mid-sixth century A.D. and reoccurring in 30 year cycles until 773 A.D. These periods of plague and famine were accompanied by a dramatic increase in warfare between polities, and coincided with a phase of tree felling, and the construction of defensive crannog sites in lakes and marshes from the mid-sixth to mid-seventh century A.D. (Ballie 1979; Gibson 1982:131-5; MacNiocaill 1972:52, 66, 101-3, 150).

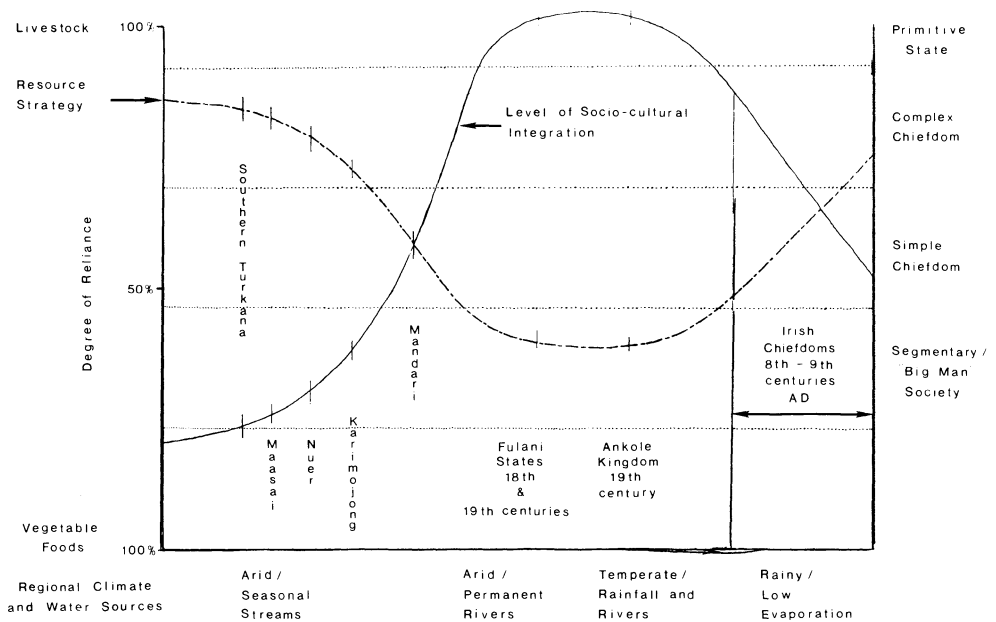
However, this relative rise in population density was not accompanied by tendencies towards nucleated settlement. Where grazing land becomes scarcer and the mobility of cattle becomes more restricted the intensification of land use would perhaps produce the effect of increasing settlement segregation. The rights of individual lineage groups to certain specific plots becomes more sharply defined. Access to these plots would become a critical issue, and homesteads would tend to become located inside their property away from other settlements.

If different livestock species are kept which have conflicting feeding behavior (i.e. sheep and cattle), they must then be managed separately - entailing more extensive land use and the investment of additional labor either in herd tending and/or in the construction of structures and facilities to ensure the separation of species. If crops are to be grown near the settlement and there is not enough available grazing land to permit transhumance, more land, labor, and investment of labor in walls or fences is necessary. In sum, these factors would seem to promote a pattern of settlement dispersion which may increase with economic diversification or intensification.

From another perspective, such segregation might be encouraged by fear of contamination from infectious diseases which would be more prevalent given higher stocking densities. Security is also a factor; the husbandman would perhaps prefer to be closer to his herds so as to offer them the shelter of his enclosure at night. Again, these factors are linked to population density and attendant intensification.

This cross-cultural survey of the political systems of pastoralist societies has elicited a cline with respect to the levels of socio-cultural integration (see Figure 9). The range is from segmentary societies with 'big man' characteristics of rank, to primitive states exemplified by Nkore and the Fulani. This cline is strongly correlated with the extent to which land can be cultivated due to the existence of available stable sources of moisture. There is also an inverse relationship between the level of socio-cultural integration and the extent to which pastoral products figure in the diet of the population.

The Turkana with the simplest social organization live in the most arid region. The Nuer live in a wetter region, yet their economy is marked by transhumance due to the seasonal flooding of most of their territory. The Mandari occupy yet a more temperate territory with woodland criss-crossed by streams. The Nkore lands are well-watered by rainfall, and the Fulani states were based upon major rivers. Irish chiefdoms fall somewhat short with respect to their level of integration compared to the Nkore and Fulani states. This is very probably due to their position on the other extreme of the precipitation cline. Here absolute limits were imposed upon the expansion of agriculture by the limited extent of cultivatable land, and the incessant rain.



**Figure 9.** Conceptual graph showing postulated relationships between a critical resource (water), subsistence (resource) strategy (relative degree of reliance on domesticated animal products and vegetable foods; dashed line), and the degree of social complexity (solid line).

Where states have emerged among agro-pastoralists where pastoralists live adjacent to full-time agriculturalists, pastoralists have dominated the cultivators. The political leadership of these agro-pastoral states has functioned to repress, restrict, and exploit cultivators, and to protect the herds and grazing lands from neighboring pastoralist states (Gibson n.d.:9-11, 24).

This is not to deny the possibility of the evolution of pastoralist states independent of the presence of pariah cultivators. The prehistory of the Ankole state may be rooted in a relatively 'pure' pastoral economy, established upon comparatively better watered lands than those inhabited by herding societies to the north.

Instead of manipulating agricultural production directly which is possible where productive resources are fixed, in Ireland one finds *indirect* manipulation through a mixture of personal and obligatory contracts; that is, through patron/client contracts. At the intra-polity level, the manner of imposing political control was also indirect, and probably for much the same reasons. A chieftain who had achieved victory over an opponent then made a gift to the vanquished which signified the submission of the latter, and his acceptance of the obligation to make periodic payments in goods and kind to his superior. This relationship lasted as long as the superior chiefdom remained militarily dominant; often for only a year or two (Gibson 1982:70-73). An inability to directly manage the principal sector of the resource base, livestock holdings, promoted an extension of the clientship principle to the political sphere.

This was a social condition imposed by the nature of the resource base, as has been argued earlier, and one which ultimately inhibited state formation in Ireland.

In essence, in attempting to explain early Irish political life we come back to the writings of Karl Bücher on the evolution of the European political economy (Bücher 1913). Everywhere we turn in Ireland, or in the pastoralist world in general we are greeted by the household as the nucleus of political and economic life. The residences of the paramount chieftains were in fact just enormous single households, just as Bücher interpreted the structure and economy of the feudal manor and the Roman villa. However, what Bücher did not account for was the *variation* in the dynamics of these different household structures, for they do span a range in the manner in which the resource base is controlled: from the slave economy of the villa, to the nested ownership rights and compulsory labor obligations of the northern European feudal state. The Irish polity lies at the extreme limit with its principle of indirect control through clientship relations.

Ireland and Ankole exhibit then a separate trajectory of social evolution heretofore not described or isolated in the literature. In these instances we have the formation of complex polities and states not accompanied by irrigation, intensive cereal cultivation or urbanization. It has been shown that an agro-pastoral resource base is accompanied by specific social institutions which relate to herd management needs, the biomass potential of the land, the financing of the political structure, and relations of dominance and subordination between polities where food production cannot be directly managed. These intensely stratified though loosely organized polities give us tremendous insight as to where to look in explaining the differences between Mesopotamia, Rome, and the feudalism of northern Europe.

## Notes

1. Due to the meager number of sites represented in the caves and specialist center site classes (and the limitations of the graphics program used), these are omitted from further consideration.
2. Knowth, Co. Meath, Uisneach, Co. Westmeath.
3. Lagore Crannog, Co. Meath (Hencken 1950), Uisneach and Togherstown, Co. Westmeath (Macalister and Praeger 1928, 1931), Knowth, Co. Meath (Eogan 1968, 1974, 1977).

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COINAGE AND COMPLEXITY: ARCHAEOLOGICAL ANALYSIS OF SOCIO-POLITICAL CHANGE  
IN BRITAIN AND NON-MEDITERRANEAN GAUL DURING THE LATER IRON AGE

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Introduction

In 1944, the late D.F. Allen published his now classic paper, "The Belgic dynasties of Britain and their coins", in which he used inscribed coinage, supplemented by the evidence of the classical texts, to write what might loosely be called a political history of late Iron Age Britain. According to his analysis, the sixty year period preceding the Roman invasion was one of political complexity, involving frequent transfers of power at particular centers and shifting patterns of territorial control. Various rulers are recorded as having fled to seek the protection of the Roman emperor. Against this background of disharmony, a trend towards greater centralization is nevertheless apparent: the expansion of a polity based on Camulodunum, modern Colchester in south-east England, to the extent that its ruler, Cunobelinus, was referred to as 'Britannorum rex' (Suetonius, *Caligula* 44, 2).

Even after his death, the capture of 'Camulodunum, the seat of Cunobelinus' kingship' (Dio LX, 21, 1) represented a major political objective during the Claudian invasion of A.D. 43. Cunobelinus' 'Eastern' paramountcy was achieved in competition with and ultimately partly at the expense of a second, 'Southern', kingdom (Allen 1944), whose ruler 'a certain Berikos...had been driven out of the island as a result of civil war' and 'persuaded Claudius to send a force there' (Dio LX, 19, 1). He has a lot to answer for! Both rulers were evidently Roman client kings, *reges socii et amici*, in treaty with the emperor (cf. Braund 1984).

Recent years have witnessed partial disillusionment with the particularistic approach favored by Allen, which employed coin evidence primarily as an indicator of historical events and tribal territories. Instead, the focus of interest, while still largely inductive in emphasis, has shifted to more general features of late Iron Age Britain and beyond. It is widely agreed that many parts of temperate Europe experienced a marked increase in economic, political and social complexity at around this time, changes variously conceptualized as Mediterranean acculturation, state formation and urbanization, etc. (e.g. Champion et al. 1984; Collis 1985; Wells 1984).

Moreover, coinage, by its very adoption and minting (and with the subsequent addition of inscriptions as evidence of literacy in some form, however restricted), is both a tangible facet of other changes taking place during the last centuries B.C., and was itself one of the most significant innovations. In both these fields, Allen's pioneering work retains importance. His paper was among the earliest to recognize in coinage the existence of a substantial body of primary data for investigating questions of economic, social and political change in later Iron Age Europe. Secondly, where the introduction of coinage was once regarded as an almost passive phenomenon, a concomitant of 'natural' economic development out of *Barbarism*, it now assumed an active role as an ingredient in many processes reflected in the archaeological record - in Allen's case, through its symbolic and propaganda possibilities, as an instrument of political control and thus in the propagation of power.

Coinage figures prominently in modern formulations dealing with the emergence of more complex societies in the areas and period with which this paper will be concerned: essentially non-Mediterranean Gaul and lowland Britain, from the third century B.C. to their conquest by Rome, respectively c. 50 B.C. and c. A.D. 43. The two most influential approaches are perhaps those of Collis (e.g. 1971, 1984, 1985) dealing with the possible inter-connection between commercialization of the economy and urbanization, and Nash (e.g. 1976, 1978a) whose claim of state formation in later Iron Age Gaul is an obvious starting point for discussion of the relationship between coinage and increasing socio-political complexity.

In passing, it should be noted that I do not intend to offer a detailed critique of these authors' work, except where their use of the numismatic data is relevant to the ideas advanced here. As they would be the first to agree, to conceptualize later Iron Age developments as 'political centralization', 'state formation' or 'urbanization' adds little to our understanding, unless we can agree the content of these phenomena and explain the processes behind their occurrence in a particular context. Where more systematic attempts at formulating explanations have been contemplated, they either seem too simplistic - the isolation of variables such as population (Bintliff 1984) or trade (Haselgrove 1976) as independent and causal, where they are clearly neither - or too gross to offer genuine insights into the nature of developments, as with much systems modelling. In any case, although improving all the time, the archaeological data pertaining to settlement pattern and function remain totally inadequate to support most economic, political and social constructions put upon them.

Alongside the real advances brought by the inductive, generalizing work already referred to, there is certainly scope for a different approach, such as will be explored here. This draws on an important, earlier analysis of coinage and economic change over the period of the formation of the centralized Anglo-Saxon state (Hodges & Cherry 1983). As these authors note, most studies employing Iron Age coinage evidence focus on questions of spatial distribution and the emphasis is largely synchronic, concentrating on the identification and interpretation of different types of patterns (e.g. Collis 1971, 1981; Nash 1976). Few of the models adduced are amenable to testing against the archaeological record and are further weakened by the lack of any general theory about coinage and currency changes which might be predicted in the context of increasing political and social complexity. This is exacerbated in situations where, as for later Iron Age Europe, there is still considerable debate over the nature of the political, social and economic structures operating, where independent confirmation is largely lacking, and where the coinage itself

constitutes a not inconsiderable part of the primary evidence, also a problem for Anglo-Saxon England.

Rather than attempting to force archaeological data to fit established socio-economic typologies, Hodges and Cherry (1983) advocated an alternative diachronic and deductive perspective. The former should permit long-term trends and major changes in coin use to be identified and linked to other archaeologically observable changes in behavior; comparison of similar sequences may bring us closer to understanding the nature of the changes involved. In generating some expectation of the changes associated with particular kinds of structural transformation, the existence of an *a priori* theoretical framework may prove helpful to the recognition of relevant patterns of behavior. A key point in Hodges and Cherry's argument is their recognition that analyses must be conducted in terms of variables which are continuously observable in the archaeological record. While coinage is evidently eminently suited in this regard, this inevitably places a restriction on the types of explanation that can be sought, permitting the major elements of change to emerge, but - the inevitable price of generalization - resulting in a loss of detail and of potentially significant variations.

Following a brief review of current ideas about the nature of Iron Age coinage and its role in socio-political and economic developments (Part 2), a series of propositions developed by Hodges and Cherry (1983), based on an earlier formulation of Rathje (1975) - his economic 'cost-control' model of production-distribution trajectories - will be compared with the sequences in three distinct coin-using areas of later Iron Age Gaul and Britain. The propositions to be evaluated concern changes in coin production and circulation expected with increasing social and political complexity. These include the probability of increases in the total volume of coinage in circulation, the size of individual issues, the degree of unit variation, the use of coinage for propaganda, and whether there were changes in the organization of production which resulted in the individual issues becoming more standardized. These are examined briefly in Part 3, together with the difficulties inherent in applying these ideas to Iron Age coin data. The three case studies utilized in Part 4 are of areas for which there are reasonably comprehensive reviews of their successive coinages.

According to current interpretation, each region underwent a different pattern of socio-political developments by the time of the Roman conquest. The first of these is central Gaul. There Nash (1978a, 1981), using a combination of archaeological, numismatic and textual sources, notably Julius Caesar's *Commentarii de Bello Gallico* (BG) describing his conquest of *Gallia Comata* in the 50's B.C., has inferred the development of a series of highly centralized polities or oligarchic states in the later second - earlier first centuries B.C. These were formed from the amalgamation of smaller territorial units, her two probable states being those of the Arverni and the Bituriges, and two other possible ones being the peoples known as the Lemovices and the Pictones.

The second area is northern or Belgic Gaul, where the sources imply a lower level of economic development and socio-political complexity. There is nevertheless a distinction between the southern fringes - the area known to Caesar as Belgium (BG II, 4), together with the territories of the Remi and the Treveri - where large nucleated settlements and other features suggest some characteristics shared with their southern neighbors (Haselgrove 1987a), and further north where the dispersed settlement pattern and other aspects of their behavior indicate genuinely acephalous communities, such as the Morini, Nervii and the various Germani Cisrhrenani (Roymans 1983).

The third area is eastern England which takes in the paramount kingdom of Cunobelinus, which developed in competition with its southern neighbor and with a series of economically-integrated peripheral groups to the north and west: the Iceni, Corieltavi and Dobunni (e.g. Haselgrove 1982). The progress of the Roman army suggests that a fourth such people, the Durotriges, were still largely decentralized at the time of the invasion of A.D. 43. The approximate location of all these groups is indicated in Figure 1.

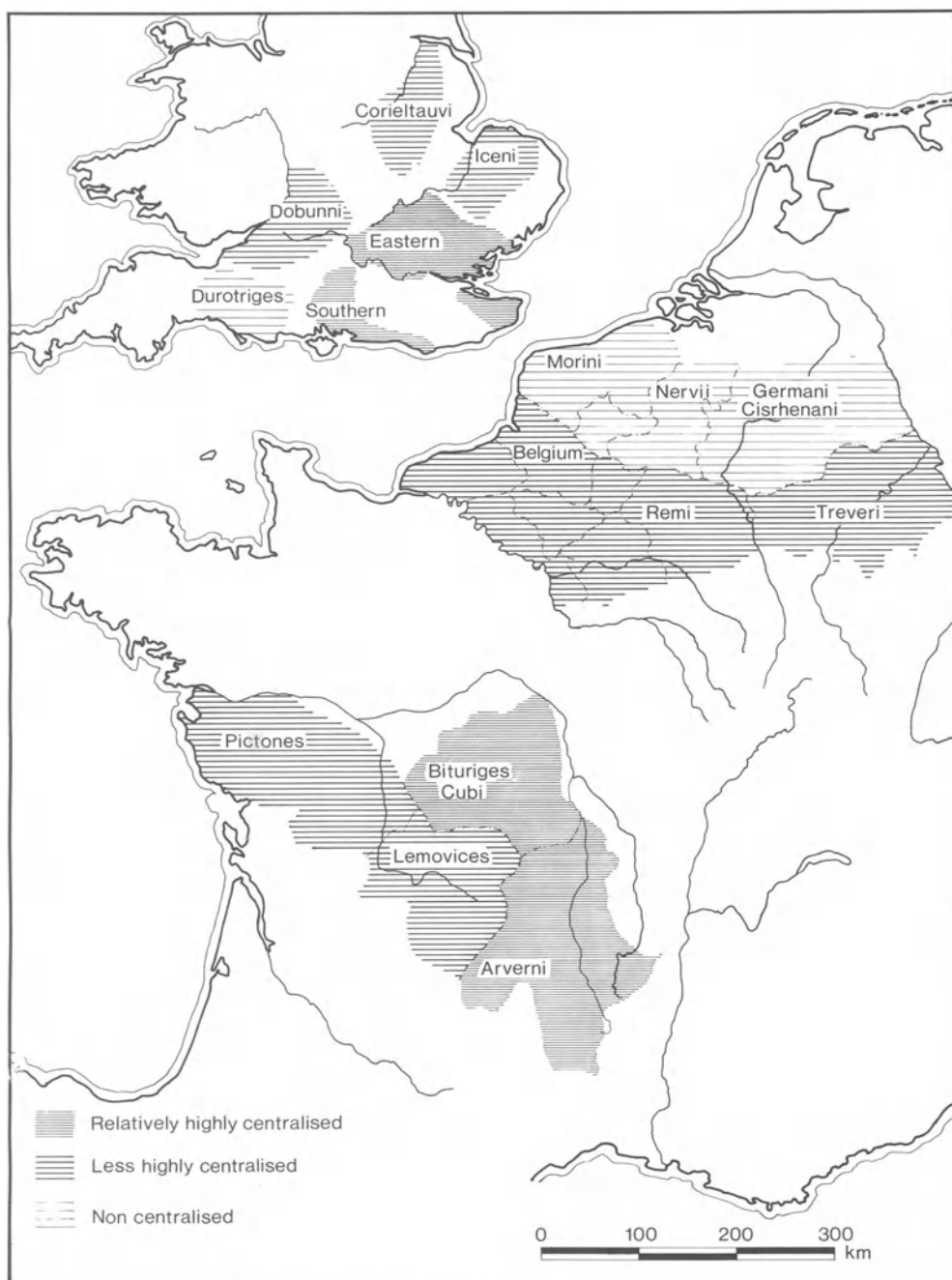
## The Context of Iron Age Coinages

Iron Age coin studies have advanced rapidly in the last three decades. This is due in part to the sheer quantity of new finds in Britain and France, which have filled many gaps in our understanding of particular series and their context (Fischer 1981, 1982, and 1986 summarize the principal publications). Similarly, quantitative analyses of coin distributions (e.g. Kimes et al. 1982) have impelled a critical reassessment of the existing database (e.g. Rodwell 1981), although the full ramifications have yet to penetrate some of the studies considered here. Belated use of methods normal in other branches of numismatics, e.g. die studies (Colbert de Beaulieu 1973) and metallurgical analysis (Gruel 1981) are starting to yield important insights into coin production.

One factor which stands out, following the sweeping changes in archaeological theory since the 1960s, is the shift from a historical paradigm to primarily social and economic concerns. Accordingly, the traditional position linking the adoption of Iron Age coinage to the needs of market place exchange and a fully commercial economy has been challenged from several directions (Collis 1971; Allen 1976; Haselgrove 1979; Hodder 1979; Roymans and Van der Sanden 1980) and a substantivist view of the function of money as dependent on the particular cultural context (Polanyi 1968) has been substituted. As a result, the relationship between coinage and other archaeological material has also had to be redefined.

Iron Age societies are at best imperfectly understood, and archaeological data suggest that their socio-political organization was largely variable in space and time (e.g. Collis 1984), making the role of coinage a key question for further investigation. At least two main levels of coin use, each embracing a variety of possible functions, can be envisaged: (1) high-value gold and silver coinages, primarily payments to meet socio-political obligations, and for mercenary hire, wealth storage, etc.; and (2) cast and struck bronze issues, whose later appearance might conceivably be linked to the need of more centralized polities to make specialized payments (e.g. Nash 1976). The presumed lower-value of bronze coinage would allow it to figure more prominently in market place exchange. This dichotomy probably oversimplifies a more complex reality, while considerable reservations must attach to those aspects of this new "orthodoxy" relating to the uses of bronze coinages.

The argument that Iron Age coinage was not struck primarily as a medium of exchange is supported by recent assessments of the coinages of the Mediterranean world, which provided the models on which all Iron Age coinage is ultimately based (e.g. Allen & Nash 1980; Scheers 1981). From their first appearance in Asia Minor in the seventh century B.C., the principal uses of Greek gold and silver coinages were to enable the issuers to obtain services or supplies or otherwise to meet inescapable obligations (Kraay 1964). Its purpose was not to facilitate trade. This pattern persisted even when states began to mint smaller denominations and bronze issues in the fifth and fourth centuries B.C. Although these



**Figure 1.** Location and hypothesized territories of the Late Iron Age groupings discussed in this paper, at the time of their conquest by Rome (Gaul, 50 B.C., Britain A.D. 43).



rapidly acquired an additional purpose in transactions between private individuals, and thus in market place exchange (Collis 1984), this remained a secondary and incidental by-product of their primary purpose.

A similar view may be taken of Roman coinage (Crawford 1985). The volume of coins minted was largely determined by the level of military expenditure and represents the conversion of bullion, booty and tribute resulting from Rome's recurrent military successes into a purchasing and payment medium. Roman coinage was not struck to provide a medium of exchange, and Crawford (1970) argues that the extent to which it was so used, at least until the early Empire, has been greatly overestimated. Certainly, there is evidence for the presence of Roman merchants in different parts of Europe long before we find traces of their money (Allen 1976).

In the Mediterranean world, the primary purpose of striking coinage was thus to make official payments, whatever secondary functions it acquired. It is inherently unlikely that an imitative coinage - as Iron Age coinages were - will have begun more sophisticated than the currency which it imitated (Allen 1976), whatever happened subsequently. Collis (1971), at least, has argued that compared to Rome, Gaulish economies by the first century B.C., were the more advanced.

It is widely agreed that the principal context in which Celtic-speaking communities first encountered Mediterranean coin use directly was as rewards for their mercenary service in the Hellenistic wars of the fourth-third centuries B.C. Readily portable valuables will have been attractive to returning warriors. Mercenary payments are now seen as a key factor, both in the initial, widespread adoption of coinage in temperate Europe (e.g. Nash 1981), and in its subsequent spread to other areas such as Britain through the employment of mercenaries in inter-group warfare within Europe (Kent 1981). The initial model is supported by the earliest imitations being based on Greek rather than Roman models, as the latter made little use of mercenaries. We should be careful though that "mercenary payments" as the explanation currently *in vogue* does not gain uncritical acceptance like the "invasion hypothesis" before it, as the only causal factor in the diffusion of Iron Age coinage - other mechanisms were almost certainly involved (Haselgrove 1987b).

A frequent occurrence in the classical sources relating to the Celtic-speaking areas of Europe, which accords with the archaeology, is mention of existing primitive valuables being used in discharging socio-political obligations, in social competition, and in wealth storage and display (relevant sources summarized in Nash 1981). The importance of wealth lay in a person's capacity to make such payments without undermining their status. Whatever the particular items involved, e.g. torcs, weaponry, cattle, slaves, such use of valuables in patron-client relations as an aspect of the reproduction of the existing social order was apparently widespread (Haselgrove 1987a). Against this background, the adoption of coinage is readily understandable. Precious metal coins were simply becoming another specialized form of valuable, subject to the same rules of use as the others and arguably freely convertible with them by weight (e.g. Allen 1976; Haselgrove 1979; Nash 1981).

Initially, much imported Mediterranean coinage may simply have been melted down and converted into other artefacts, but in time it is easy to see coinage with its greater versatility all but replacing many traditional valuables. This leaves us with the complex question of why coin use never developed in some areas, e.g. in the far north of Belgic Gaul (Roymans & Van der Sanden 1980) or the highland zone of Britain (Allen 1960). Relevant factors include the sophistication of existing currencies

and a group's overall level of symbolic development; lack of the requisite resources; specification of wealth in incompatible categories or differently. On a different tack, one might cite the German-speaking peoples' supposed indifference to silver and gold (Tacitus, *Germania* 5); or outright rejection of an alien innovation, just as the Nervii denied access to Roman traders and to wine and other luxuries (BG II, 28). No simple answer is possible.

Few groups north of the Alps appear to have struck coinages while the prestigious Greek originals remained readily available as payments for mercenary services. But when this external supply was severed, indigenous production rapidly became widespread. The absolute chronology is problematical and is possibly unduly depressed by the search for suitable historical contexts (Haselgrove 1987b). A few series are securely dated within the third century B.C. by grave finds (Polenz 1982), but Nash (1987) may be correct that the Roman conquest of many communities which had previously employed mercenaries was the paramount factor. In that case, most coinages will date from the end of the third century onwards, when Roman expansion in the Mediterranean began in earnest.

In the gold-using areas of Gaul, these derivative coinages passed through three distinct phases: (1) close imitation of Greek originals; (2) the first development of local gold types, with weights not normally below c. 7.60 gm and in good alloy; and (3) a final phase of local development, characterized by further new types, high output, and generally low weight and precious metal content (Nash 1975). The so-called silver belt to the south (Allen & Nash 1980) displays a parallel development. Nash (1987) argues that the same three-stage progression can be observed, in some form, in almost every Celtic-speaking coin-using area: from an initial, high-value coinage sometimes bearing a wide-variety of types and often with very diffuse distributions, to a second phase of more organized coinage, still of relatively high value, but with fewer types and more clearly defined distributions; to a final phase characterized by relatively few regional types, the introduction of low value fractional coinage, sometimes in bronze, and more restricted distributions (Nash 1976, 1978b). Indigenous production terminated in Gaul in the late first century B.C., the Roman monetary system having by then prevailed (Crawford 1985) and in Britain fifty years later.

Central to this paper is Nash's contention that this progression relates to concomitant social developments over the same period, from complex tribal organization to emergent statehood in the areas in closest contact with the Roman world. In particular, she argues that the first phase coinages are those of competing chiefdoms, perhaps acknowledging common ethnic or cultural identities, but lacking centralized military leadership. The second stage represents a more advanced form of the same society, with a deepening of the elite hierarchy and increasing territorial cohesion reflected in the coinages. The final stage coinages emanate from the most complex societies, paramount tribal kingdoms and oligarchic states, reflecting their particular social and political needs and new-found territorial identities (Nash 1987:48-55).

In the second phase, inter-regional convertibility remained important, and with the need of elites to exchange gifts and attract mercenaries from other groupings, coins were often being hoarded along with other valuables. Despite a general drop in weight and fineness owing to the greater volumes struck, coinages from the different regions remained compatible in weight and alloy.

Similarly, in the third phase, the coinages of the paramounts still had to be compatible between territories, whereas in the areas of state

formation, this was not so. Instead, in these latter regions the coinages break sharply with the past, perhaps reflecting the new political self-awareness of their issuers (Nash 1978a) and they are also more individualized, not only in the types employed, but also in their weights and alloys, even between neighboring territories. Fewer types of precious metal coins were struck, but these were issued in still greater volumes. Finally, bronze coinages were also now produced in enormous quantities. On the Mediterranean model these low-value issues were needed to pay the various servants and possibly soldiers of the urban communities at the core of these new polities, who, no longer producing their own subsistence, had to purchase it from those who did (Nash 1976, 1987).

Although Nash's model is undoubtedly attractive and full of insight, aspects of her argument do not stand up to detailed scrutiny. The principal doubts revolve around two areas: the social and political inferences drawn from the fractional currencies - given the lack of independent evidence of coin function - and secondly, whether the case for a degree of socio-political complexity amounting to statehood really is as overwhelming for central Gaul and elsewhere as Nash herself believes. Although both archaeological and numismatic data are used to support her arguments, these in the end rest primarily on her reading of the classical sources.

For Nash, the fractional issues of the third phase are an important indicator of the new-found political stability and consolidation within well-defined territories, whereas the previous picture was one of fluid boundaries as individuals competed for power through military success. However, analogy with later medieval England allows the same evidence to be interpreted differently (Casey 1986). There, small change developed because of mobility, itself an expression of the changing structure of society. With a breakdown in the cohesion of communities, the need for immediate payment of obligations became more pressing. Credit was not granted to outsiders, so a token coinage evolved with which to settle small transactions (Casey 1986). In this model, fractional coinage is linked with an increasingly mobile society and a concomitant growth of commercial distrust. For Casey then, the advent of low-value currencies in the late Iron Age may be symptomatic of a similar loosening of social and political control at the period.

Similarly, the larger, and comparatively well-defined geographically, high value coinages of the second phase could be held to indicate more cohesive and stable socio-political groupings than Nash's model allows. The interpretation of high-value Iron Age coinages as reserved for the social and political obligations of a competitive warrior elite is based on the apparent unsuitability of these coin types for use in small transactions (Casey 1986). However, wherever there is an adequately developed credit system these can operate perfectly well. The medieval analogy shows merchants and other suppliers covering wide territories, dealing with large numbers of small, immobilized communities. Credits were given and debts accumulated until they were large enough for individuals to discharge using the existing currency units (Casey 1986).

Successful operation of the system requires only that obligations are recognized and can in some way be enforced. Arguably, the small-scale communities and dispersed settlement pattern inferred in many areas of Europe during the middle La Tène period (Collis 1984) would provide the perfect setting for such a system, although Casey's analogy should probably be rejected for its anachronism on other grounds. In passing, the first century graffiti at the Magdalensberg in Austria may be noted. These refer to the credits operated by the enclave of Italian merchants residing there, and four times to payments in gold (Collis 1985). How much this

extended to the indigenous community rather than to Italian trading partners is unclear. However, Casey's general point is valid and important. Radically different models can be formulated from the numismatic data where independent confirmation is a problem. Without external evidence, the movement from Phase 2 to Phase 3 coinages in Iron Age Europe is as plausibly interpreted as emphasizing the loosening of existing, comparatively stable socio-political groupings experiencing a period of profound economic and social change, or as a tightening of control with the emergence of a new order of more strongly centralized and highly organized polities. Dalton's (1977) contention that coinage occurs only in state societies is irrelevant, apparently invalidated by the earliest stages of Iron Age coinages, and a reminder - if one is necessary - that the ethno-historic spectrum of societies is unlikely to be fully representative of those which existed at other times and places.

How strong then is the case which Nash (1976, 1978a) has made, led by the classical sources (notably Caesar) for state formation in central Gaul? The difficulties of the texts have been reviewed extensively (e.g. Collis 1985) and include the propagandist purpose of some compilations; general shortcomings ranging from bias, misrepresentation and selectivity to complete errors, omissions, mistakes of transliteration and partial survival. Three problems are particularly relevant here: interpretation according to our own, ethnocentric frame of reference, the ethnocentricity of the original observers, and a frequent lack of geographical and temporal specificity, or sometimes the converse: generalization founded on specific observations of economic and social practices drawn from different, perhaps unconnected cultural contexts.

Thus, as I have noted elsewhere (Haselgrove 1987a), Nash and Crumley (1974) differ markedly in how they read Caesar's text relating to the hierarchical organization of Gaulish society (*BG* VI, 13) and in how they interpret the principles of stratification and other processes behind the perceived pattern of increased differentiation in the late Iron Age. Both, though, concur on two points: (1) the texts indicate a socio-political organization and degree of economic specialization completely different in nature and scale from its predecessors; and (2) the actual formation period of the states was short and intimately linked to the expansion of Roman political and economic interests beyond the Mediterranean sphere. Both authors thus implicitly accept the institutional terms used by Caesar to convey to his audience at Rome the characteristics of these Gaulish groups, clearly a contentious point.

A further problem is that Caesar and Strabo (*Geography* IV, 4, 3) largely based their descriptions of Gaulish socio-political organization on a single group, the Aedui (Nash 1978a). The validity of generalizing from them to other groups is dubious. The Aedui were evidently among the longest-established paramount communities (*BG* VI, 12) and Rome's oldest allies in *Gallia Comata*. Whether or not correctly conveyed by Caesar, their institutional development is an uncertain guide to that of their contemporaries, even near neighbors such as the Arverni or the Bituriges with whom Nash's detailed studies are concerned (1978b).

These are areas where the use of the term urbanized to describe even the leading fortified sites seriously overstates the position that we can demonstrate for the pre-Conquest period by archaeological means (Ralston 1984). There are sites which demonstrate settlement nucleation in the earlier late La Tène period (Colin 1984), but these are either beyond the limits of central Gaul, or fall short of the criteria demanded of urban centers. Most major sites mentioned by Caesar have evidence for intensive occupation only from the mid first century B.C. (cf. Collis 1985), and their pre-Conquest status is anything but clear. Finally, Nash's use of

coinage distributions to demonstrate the territorial coherence and sub-divisions of her emergent states is open to much the same criticisms as she had earlier (1975) rightly levelled against Colbert de Beaulieu's (1973) work. The coins are mapped on to the *civitas* territories as these are inferred from the later Gallo-Roman diocese boundaries, and frequently assigned to a particular people from very few findspots, or even from hoards, despite those often being concealed outside their contents' home territories (Allen 1960).

The case for a high level of socio-political complexity throughout central Gaul is thus by no means unassailable. More complex developments may have occurred elsewhere. None need amount to political statehood. The evidence adduced in Nash's separate lines of reasoning can be interpreted differently; the conclusions from both rest ultimately on analogy to the Mediterranean world. Our 'knowledge' of the Gaulish 'state' depends principally on the validity of the categories Caesar uses to convey the characteristics of leading Gaulish communities to his own kind. Nash's idea (1987), derived from Strabo (*Geography* IV, 1, 5), that the constitution of the early Gaulish state was modelled on Massalia has little substance. Similarly, the loose derivation of the earliest bronze coinages from those of Massalia need not imply that they or others were issued for the same reasons as by Mediterranean city-states. The two lines of argument must be brought together within a theoretical framework dealing with the changes predicted in coinage systems concomitant with increasing socio-political complexity and economic development, to which I now turn.

#### Changes in Coinage Systems: Some Propositions

For their framework linking coinage and increasing socio-political complexity, Hodges and Cherry (1983) drew substantially on an earlier formulation of Rathje (1975). Briefly, Rathje's ideas focus on how societies, as they become more complex, adapt to the exponential increases in information processing and decision-making which hierarchical growth and increasing internal differentiation entails. This process extends to the realm of material culture, owing to its role in cultural integration and communication networks - as counters, status indicators, symbols, etc.

However, no society has infinite resources to invest in solving these problems of expansion, and its capacity to overcome them by developing entirely new institutions is also limited, particularly when expansion is rapid, so the strain has to be compensated for in other ways. Specifically, one form of compensation is the introduction of "cost-control" techniques. These decrease the human and material resources invested in the production and distribution of those material culture items with an important integrative function, through standardization and simplification and by increasing the number and dispersion of such items. As a society continues to expand and encompasses greater variety, existing "cost-control" techniques may be modified to meet increasingly specialized local requirements (Rathje 1975:412-8).

Thus, compensations for increased demands occur in a predictable order, which can be monitored through accompanying changes in material culture. There is a shift from an essentially *social* form of integration based on elite reinforcement through labor-intensive products loaded with psychological and ideological values, to a more directly *economic* form of integration using low-investment commodities in much greater quantities. Rathje's ideas, of course, rest ultimately on the concepts of systems and information theory. From them, Hodges and Cherry (1983:148-151) have

derived six general principles for coinage arising out of its potential in a wide range of integrative roles. The main points of their propositions are that as societies become increasingly large-scale and complex, the following developments can be expected:

(1) The total volume of coinage within the system will increase. This is an obvious corollary of Rathje's model. Where coinage functions primarily as primitive valuables, large quantities are unnecessary, but with a shift to "early cash" usage (Dalton 1977), the demand for coinage rises with the increasing number of transactions for which it is required.

(2) The size of individual issues will increase. Apart from acquiring the raw materials, the main costs for an authority issuing coinages are incurred in producing the dies and striking or casting and distributing the coins, together with any measures to combat counterfeiting. It is in these areas that cost-control measures are to be expected, most obviously by using dies until they are too worn for further production, and by retaining die-designs without modification. Where coinage is neither circulating in bulk nor issued by a single central authority, minting will be expedient, to meet particular needs, and thus discontinuous. Few dies will be used to capacity.

(3) Unit variation within the system will increase. With more efficient production methods and larger issues, the fixed overheads of minting are spread over a larger overall output, and the costs of making a single coin decrease, regardless of its face value. This is particularly important for base metal types, whose manufacturing cost relative to their actual metallic value is generally high. Their widespread introduction is therefore facilitated. Through time, therefore, a coinage system based on a single high value metal and using only a single unit of account will be transformed into a multiple unit system using more than one metal simultaneously, with relatively fixed standards of inter-conversion. Issuing authorities will be increasingly concerned to ensure equivalence between the actual and face value of these units by regulating their weight and purity and manipulating the money supply in relation to demand. The economies of scale resulting from mass production enable authorities to introduce a more flexible and widely applicable monetary system. This would explain why token coinages are primarily associated with developed, complex societies.

(4) The organization of coin production will change. Increased demand for coinage and the act of supplying all locations within the polity with readily identifiable coins may, in time, necessitate additional mints, the expansion of existing mints, or both. To reduce transportation cost, the mints should be regularly spaced throughout the areas they supply. In practice, however, political factors generally distort these purely economic considerations, with central authorities seeking to exercise closer control on the monetary system. With the emergence of unified polities, incorporating previously autonomous areas, a trend towards more direct control is likely. This is effected by establishing a single, centralized, large scale mint, or by manufacturing dies centrally and distributing them to other mints, or by otherwise regulating the output of local mints.

(5) Individual coin issues will become more standardized. Particularly in the later stages of this trajectory, greater standardization of the weight and purity of coins within individual issues is probable. Measures may also be taken to guarantee the purity of a coin and protect it against fraudulent clipping during circulation, so that testing at individual transactions is unnecessary.

(6) The use of the coins for propaganda will increase. With the incorporation of previously autonomous territories generating ever wider patterns of coin circulation, coin types will become more detailed and specific to reinforce their identification with the issuing authority in remote areas. Ideology and peaceful persuasion are as important as military force in exerting control over such areas. As a vehicle of propaganda, depicting rulers and their exploits, and legitimating their claims, coinage is a particularly effective medium for asserting authority throughout the population. A corollary of such changes may be the increased use of control marks or other symbols to ensure the authenticity of coinage circulating at a distance from the center.

In testing these propositions, Hodges and Cherry (1983) were primarily concerned with Anglo-Saxon England and its coinages. Many problems they discuss are common to all coin data, such as the improbability that site finds offer a representative sample of the coinage in circulation, owing to differences in value, use, etc. (e.g. Casey 1986; Haselgrove 1987b). However, compared to Iron Age Europe, the period they discuss has several advantages, most obviously the superior historical framework relating to socio-political developments and economic changes. Equally, Anglo-Saxon coins generally offer more detailed insights into the mints, moneyers and commissioning authorities involved, and have therefore been studied in greater detail.

Conversely, the remaining problems of attribution and chronology are generally magnified in Iron Age contexts. Where the relationship between Anglo-Saxon coin distributions and the territories and organization of known polities can often be studied in their own right, for Iron Age coinages these are largely a matter of assumptions - which may well be invalid. Furthermore, the Anglo-Saxon period from the fifth to the tenth centuries A.D. is between two and three times the duration of the coin-using period of the Iron Age, enabling long-term socio-political and economic trends to be distinguished from short-term cycles of limited influence and importance. The impact of Roman expansion and her monetary system on both Gaul and Britain, first through economic and political interaction, and then by military conquest and annexation is a final complication. Many Gaulish "Iron Age" coinages in silver, and especially bronze were actually produced during or after the conquest period (e.g. Allen & Nash 1980; Scheers 1977).

I have discussed what can be inferred about the scale and organization of minting elsewhere (Haselgrove 1987b). Briefly, die studies and statistical estimation techniques can, in principle, indicate relative differences in the scale of individual series. However, the resultant estimates of the number of dies are, at best, very imprecise, and accurately quantifying the coins struck from each die, or even - owing to variable conditions of striking - an average figure is almost impossible (cf. Hodges & Cherry 1983). Also, mainly precious metal series have been studied (e.g. Allen 1970). This is doubly unfortunate, as the statistical assumptions required by die estimation techniques are particularly dubious where hoard finds predominate. Coin survival rates, usually between one and four per die (Haselgrove 1987b), demonstrate just how partial is the surviving sample. At most, these methods can detect order of magnitude differences in the volume of coin production and circulation.

As Collis (1971) has argued, centralized, controlled minting is just one of several patterns which can be envisaged in an Iron Age context. However, the survival rate of equipment and facilities associated with minting coinage is poor in both Gaul and Britain (e.g. Allen 1976), and there are few published metallurgical analyses (cf. Scheers 1977). Much is made of the baked-clay slab moulds widespread on major and minor sites in

the coin-using areas (Tournaire et al. 1982), but this is contentious as evidence of mints. The moulds were certainly associated with metalworking, as analysis indicates gold, silver and copper residues and some had metal pellets *in situ*. But Sellwood (1980) disputes their association with manufacturing coin blanks on technological grounds. These, he suggests, were made by pouring, while the moulds were used to count pellets for alloying. The question is unresolved, although the close correlations in space and time remains suggestive.

A clear distinction must be drawn, in any case, between manufacture making the dies and blanks, and striking the coins - and where the finished coins were actually issued. Placing reliance on inconclusive correlations between scant distributional evidence and particular places has already been criticized. Some coinages may have been struck at more than one location, with the dies being transported between workshops, and issued from yet other sites. Only where legends referring to identifiable places appear on the coins, as with some later British series (Allen 1944), does the picture become clearer. Even so, it is still an assumption that the coins were actually minted and issued at the place named. In short, studies of Iron Age coin production are in their infancy and only coin series with at least ten distinct find locations predominantly within the territory to which they are attributed will be discussed here.

#### The Case Studies: (a) Central Gaul

The geographical focus of Nash's detailed work (1978b) is the territory occupied at the end of the first century B.C. by four major central Gaulish *civitates* - the Arverni (Auvergne), Bituriges Cubi (Berry), Pictones (Poitou) and Lemovices (Limousin) - their names still readily recognizable in those of the later regions. The Lemovices must, however, be set aside, as the attribution of the two principal coinages claimed for them in the first century B.C., the gold 'crane and trefoil' series and the silver 'severed head' group (Nash 1978b) is difficult to uphold. Both coinages have extensive distributions with only 38% and 25% respectively of their find locations in the Limousin, and over a third of them hoards. Their existence can thus hardly be held to indicate a marked increase in socio-political complexity in the Limousin during the first century B.C.

The settlement record of Limousin is equally negative (cf. Ralston 1984). The large volume of lower weight later silver can be inferred from a lack of die identities (Nash 1978b). The often careless manufacture and a high incidence of unrecovered hoards are all compatible with the circumstances of the Caesarian war; a brutal, alternate stimulus to the implementation of "cost-control" techniques in coin production which intrudes on the numismatic record throughout Gaul.

The precious metal issues belonging to the first two of Nash's (1987) coinage phases are sparsely represented throughout central France. Only late in her middle phase, in the later second century B.C., does this pattern change, and then only in Berry. Two series break with the past: the "Berry type" gold of east Berry and the "West Berry" silver series, which has a complementary distribution to the west (Nash 1978b). The gold coins are mostly single finds (as opposed to hoard coins), suggesting an increased volume of coinage in circulation, while the number of dies used, some of them very worn (Nash 1978b), argues for a larger issue than previously. The 'Berry type' has a concentrated distribution, conforming to the bell-shaped dispersal pattern predicted of centralized production (Collis 1981). The predominance of quarter-staters could also imply the use of gold in an increasing number of transactions.



In this case, therefore, the coin evidence meets at least the first two of our propositions, and may indicate socio-political consolidation in east Berry late in Nash's middle phase. By contrast, the contemporary "West Berry" silver is preserved almost exclusively in six large hoards. These contained a mixture of the three principal varieties, each of which are probably from separate mints. Some coins are worn and others struck from worn dies, but - unlike the gold - the majority evidently had not circulated freely. Moreover, the latest coins are carelessly struck, using broken and retouched dies. This suggests an emergency issue. With the exception of east Berry the coinage thus offers little support for Nash's idea (1987) of a deepening of the elite hierarchy and increasing territorial cohesion during the middle phase anywhere in central France. A reassessment of the background to later Iron Age developments is clearly called for.

In the final phase, coinages do change dramatically with the issue of bronze and the reintroduction of legends. These are sometimes in Greek or mixed characters as in the Rhone Valley and Belgic Gaul respectively, but mainly they are in the Roman alphabet, as in central Gaul and Britain. What is less certain is which changes took place before - as opposed to during and after - the Roman conquest, and what proportions of the different *civitas* territories formalized by Augustus in 27 B.C. these affected. Thus, the coexistence of extensive gold and silver series in Poitou, in the earlier first century B.C. recalls the situation in Berry in the second century B.C., and hints at a comparable increase in socio-political complexity, but no more. The two series have overlapping though not coextensive distributions and are rarely found together. They are also quite separate in their types and outside connections and were probably struck by different groups. The gold coins, some of them inscribed SA, are markedly Armorican in style and fabric, while the PIV silver is derived from the earlier "West Berry" silver series (Nash 1978b). Both series, however, were still being issued at the time of the Roman invasion, extending their distributions, and they occur in several Caesarian war hoards. Until this period there was no bronze or fractional coinage in the area.

After the Conquest, the coinage changed radically, comprising inscribed silver and bronze issues and eventually the highly Romanized CONTVOVTOS group of bronzes. The silver issue inscribed CVRAT IVLIOS was struck on the Romanized or 'Gaulish' 'quinarius' standard, which became universal in Gaul at this period. It is identified with the Duratius mentioned as a collaborator in 51 B.C. (BG VIII, 26-7) and who was presumably subsequently rewarded with Roman citizenship. It is likely that here, as in some other regions, the drain of precious metal out of Gaul consequent on defeat was the major factor in the switch to bronze coinages (Haselgrove 1984), rather than the loss of freedom to make war on other groups under the *pax Romana* removing one of the principal reasons for striking precious metal coinage. Already, by the end of the war, some bronze was being struck in Poitou, as one type was found in the Alesia battlefield deposit of 52 B.C. (cf. Allen & Nash 1980). The loss in weight and fineness from the relatively good uninscribed gold of near 7.0 gm to the base SA coins of c. 5.4-6.2 gm (Nash 1978b) matches the fall recorded in other regions such as Belgic Gaul (cf. Scheers 1977). Otherwise, however, the post-Conquest coinages reflect the organizational needs of the pro-Roman leadership following the incorporation of their territories.

Similarly, changes in the pattern of coin use express the evolving values of Gaulish society on becoming part of a much larger scale polity - most obviously, the new practice throughout Gaul of making monetary offerings at temples, which has resulted in the survival of Gaulish bronze

coins in such enormous quantities today. This innovation had its origins in the Roman world (Gruel & Clement 1987), replacing an earlier custom of dedicating weaponry on sacred sites (Bruneau 1986). Thus, although Poitou is claimed as a probable area of state formation (Nash 1976, 1978a), the coinage, like the archaeology, offers little indication of greater socio-political complexity, the major changes taking place vary largely after the Conquest as a function of the large-scale, complex society of which the indigenous peoples were now a part, rather than earlier.

Like the Aedui, the territories of the Arverni, bordering the Roman province created in c. 121 B.C., and the Bituriges Cubi were well placed in relation to the long-established corridor of Mediterranean influence through the Rhone valley. Later Iron Age nucleated settlements are known in both areas, including Levroux on the densely populated Berry limestone plateau and Aulnat on the agriculturally rich alluvium of the Limagne valley. However, the major fortified sites such as Gergovie have no evidence of intensive occupation before the mid first century B.C. (Collis 1985), although new excavations could modify this picture, as at Mont Beuvray in Aeduan territory (cf. Collis 1984). Dense settlement in the Auvergne is apparently confined to the Limagne, the only large fertile valley in otherwise mountainous, granite country.

In both areas, the late phase coinages contrast markedly in type and volume with their predecessors. They also conform to the idea of a breakdown in inter-regional convertibility at this period, apart from the increasingly widespread conformity with the Romanized 'quinarius' standard (Nash 1987). Thus in Berry, the 'Sword group' silver was struck on the Gaulish 'quinarius' standard, but Arvernian silver was minted on its own, higher standard. Similarly, Berry gold weights lie primarily in the echelon 6.8-6.9 gm, whereas the principal Arvernian series has a mean weight of c. 7.4 gm (Nash 1987b).

The preferred fractional denominations also vary. In Berry, the gold output utilized staters, thirds and sixths; the silver units used rare fractions. In the Auvergne, the gold is almost all in staters with occasional quarters, but the silver has halves and eighths as well as units. Several series were bimetallic or even trimetallic: in gold and bronze, the ABVDOS group in Berry; in silver and bronze, the Berry 'Sword group' and the Arvernian series inscribed EPAD; and in all three metals, the Arvernian 'A' and 'B' series (although the single 'A' bronze is possibly aberrant, while common authorship of the 'Fox' bronzes and the 'B' series need not follow from their stylistic affinities). EPAD, who continued to issue coins after the Conquest in more Romanized types is plausibly identified with Epasnactus 'Arvernus, amicissimus populo Romano' (BG VIII, 44, 6; Nash 1978b). VERCINGETORIXIS, despite his retention of the wine amphora symbol from other 'A' series gold is undoubtedly Caesar's implacable opponent. Lastly, the Les Arenes site at Levroux (Fischer & Buchsenschutz 1987) furnishes clear, if contentious, evidence of the pre-Conquest use in part of the region of both cast and struck bronze issues, including the 'Wolf head' series which may be a local product (Nash 1978b).

The behavior of these coinages according to 'cost-control' principles is thus potentially much greater than any of the other series examined so far. The volume of coinage in circulation increases considerably, as did the size of individual issues. Several series are known from more than ten separate finds (cf. Nash 1978b): the 'A' and EPAD series and bronzes inscribed VERCA in the Auvergne; the ABVDOS and 'Sword' group and the struck 'Wolf head' and cast 'Swastika' bronzes, all in Berry. With more detailed recording, several other series will probably turn out as common.

Over 300 dies were used to produce the 596 'Sword' group silver coins in the Moulins-sur-Cephons hoard alone (Nash 1978b). The ABVDOS group includes an extensive bronze series with constant types, but inscribed with different names, most of them present at Alesia and thus pre-Conquest. The increase in unit variation has already been noted with the complex series of fractions and the issue of coin sets in more than one metal. The Berry 'Sword group' is quite possibly the product of several mints, since as many as sixteen different symbol combinations are known (Nash 1978b:Fig., p. 218), though the dies for some of the different varieties were probably engraved at the same place as their stylistic treatment suggests the work of a single artist (Nash 1978b).

The 'Sword group' die found at Puy de Corent in the Auvergne is presumably a by-product of the Caesarian war. Obverse dies linking different reverses, with the exception of the 'fern' and 'branch' series, are not recorded. Either way, the thorough mixing of 'Sword group' varieties in hoards and their conformity in weight implies a uniform circulation validity within the area. The same pattern is found with the many different varieties - at least twenty-four of Arvernian coinage (Nash 1981). Insufficient data exist to investigate whether individual issues became more standardized. By and large, the types also remain generalized and unspecific, although in more variety, and overt propaganda use is evident only after the Conquest in the Romanized standing warrior issues of Epsanactus (Nash 1978b:Fig., pp. 423-4).

The behavior of these coinages, then, is entirely consistent with increased political complexity during the later Iron Age, but whether this amounted to centralized statehood encompassing territories synonymous with the later *civitates* is debateable. In distribution, the principal Arvernian coinage is confined almost exclusively to the Limagne. Even allowing for the influence of differential settlement density, it cannot have performed a role in integrating the larger territory, while several small silver issues localized in the mountainous areas provide an indication contrary to centralized control (cf. Nash 1981). This does not mean that the inhabitants of the Limagne did not dominate their smaller upland neighbors. Indeed, these were quite possibly the Averni's otherwise unrecorded dependents listed by Caesar (*BG* VII, 75).

Uncontrolled production by rival members of the elite with sufficient resources (Collis 1971) is as good an explanation for the different Arvernian coin varieties as striking by different moneyers. The two other dies found at Puy de Corent, one certainly, the other probably for the Arvernian bronze series inscribed (A)DCANAVNOS (Malacher 1987) - the coin itself found frequently on the site - indicate one such local production center. However, few of the later phase changes, including bronze production, need significantly predate the Conquest. Aulnat, for example, has only a single cast coin (which may be an import to the region), from a context which might be earlier, as opposed to nine examples from later deposits (Nash & Collis 1983).

In Berry, where earlier bronze production seems assured, it cannot be positively linked to the precious metal issues until the Caesarian horizon. Generally, the range of types and differences in the settlement assemblages (cf. Nash 1978b) suggest relatively localized issues, whose circulation patterns were subsequently shaken up by the war. The earlier east-west dichotomy in the distribution of the major gold and silver series persists into the late phase. To explain this as continued minting by two previously independent peoples now unified in a single polity (Nash 1981) appears contrived, although the unity of the ABVDOS group in the eastern district does suggest that there the earlier trend to centralized political authority may have intensified.

Elsewhere, the patterning approaches the conditions postulated under Casey's (1986) model, linking localized token coinages to a breakdown in social cohesion concomitant with increased population density and mobility. With the growth of ever larger communities, the exchange of bronze coinage for services by the groups controlling these nucleated settlements would have provided them with a mechanism for binding populations containing more outsiders - too large for effective organization on kinship lines - to them. Once bronze coinage entered into circulation, it provided a means of regulating the increasing number of transactions between the individuals no longer linked in this way. Thus, an economic mode of integration is substituted for one that was previously primarily social.

A high proportion of some varieties of the 'Sword group' silver are carelessly made from poorly engraved dies (Nash 1978b). Again, the Caesarian war should not be underestimated as a factor in the increased volume of late phase coinage and the use of base metal. The possible biases imparted by the much higher survival rate of late coin types, a function of the number of hoards and excavated settlement contexts dating from the mid first century B.C. onwards and the new practice of temple offerings, should not, however, be overlooked. Full die studies and quantitative analyses of variations in coin deposition in different areas and in dated settlement horizons are urgently required throughout central France to supplement the present qualitative and typological approach and provide a less subjective measure of the nature and volume of coin circulation among its constituent peoples and polities.

#### (b) Belgic Gaul

The level of contemporary socio-political complexity in Belgic Gaul is widely considered to lag behind areas further south (Roymans 1983; Haselgrove 1987a) and it thus provides an interesting contrast with central Gaul. The two major coin groupings are in 'Belgium' in the restricted sense in which its inhabitants used the term (BG V, 24), from where the idea of coinage was exported to south-east England, and in the east, in what was later the territory of the Treveri. To the north, many coastal communities had no coinages until a late date or only used coins imported from elsewhere in Belgic Gaul. Gold was the only metal used in all three areas prior to the mid first century B.C., apart from a few distinctive thin silver issues found in Picardy (Scheers 1977:Nos. 51-3). All these coinages are, however, uninscribed and neither the silver, nor the few bronze series with possible pre-Caesarian origins (e.g. Scheers 1977, Nos. 155, 163), can be related to particular gold types and will not be discussed here.

In the densely settled chalklands of Champagne, which became the territory of the Remi, and further south-east in the territory of the Leuci (outside the present study area) coinage developments followed a different path with extensive cast bronze issues (e.g. Scheers 1977:Nos. 186, 191, 194). This was essentially a continuation of the core area of potin production in eastern-central Gaul (Allen & Nash 1980). Notwithstanding the arguments of Colbert de Beaulieu (1973), the archaeological evidence leaves little doubt that these coinages had achieved an extensive circulation by the early first century B.C. (Furger-Gunti 1982; Polenz 1982). With their high weight, glossy tin-rich fabric and types depicting prestigious items such as torcs, these potin coinages were probably issued to meet similar functions to precious metal coinages by authorities lacking the requisite resources. There is certainly a comparative dearth of attributable gold series in the area. Once in circulation, site finds from nucleated settlements, e.g. Basel and Variscourt (Colin 1984),

indicate that potin increasingly acquired uses in everyday transactions, perhaps by a process not dissimilar to central Gaul.

During the Caesarian war, silver coinages began to be minted on the 'quinarius' standard, often overstruck on central Gaulish coins as at Villeneuve St. Germain (Debord 1982). These continued after the war (e.g. Scheers 1977:Nos. 41-2), now accompanied by an enormous variety of struck bronze coinages. These are generally inscribed, sometimes alluding to their issuers (e.g. Scheers 1977:No. 146, inscribed REMO/REMO) or to important Romans such as Aulus Hirtius, propraetor of Gaul in 45 B.C. (*ibid.* Nos. 153, 162), and eventually completely Romanized (*ibid.* No. 216). Although Scheers' detailed study has imparted a possible bias, the volume of these post-war coinages was clearly enormous; twenty three series are known from over ten finds, six of them from over fifty. These coinages provided the model for the earliest struck bronze coinages in south-east England (Haselgrove 1987b).

Scheers' work allows the changing volume of gold coinage minted to be estimated reasonably precisely (Haselgrove 1984). In 'Belgium', the early phase coinage based on a half-stater unit and derived from Tarentine prototypes (Scheers 1977:Nos. 1-5) employed at least 62 dies. This was followed in the middle phase by the staters and quarter staters (*ibid.* No. 8) struck on a large flan from an estimated 100 dies and in the late phase by a stater-only series (*ibid.* No. 9), from c. 70 dies. During the Caesarian war, however, output rose to a massive c. 1470 dies for the succeeding uniface series (*ibid.* No. 24), and closely related coinages also appeared in adjacent areas (e.g. *ibid.* No. 26, c. 330 dies, No. 29, c. 165 dies; Haselgrove 1984:Table 2).

Output also increased massively in the eastern area during the Caesarian war. The principal early series of staters and quarters (Scheers 1977:Nos. 16-20), employing c. 480 dies, was followed by a series of greatly reduced weight and fineness (*ibid.* No. 30, Classes 1, 4, c. 515 dies), and then by the massive wartime rise in production (*ibid.* Classes 2-3, c. 1450 dies, Class 5, c. 525 dies). In this process the weight and fineness of the gold fell from over 8.0 gm and 95% purity in the west and c. 7.1 gm, 78% gold in the east, to c. 5.5 gm, 50% purity and 5.4 gm, 35% purity respectively, by far the greater part of this loss occurring during the first century B.C. and between 57-50 B.C. in particular.

Assuming the fall in weight and purity to be balanced by using the dies to capacity, over fifteen times as much fine gold as previously must have been required in 'Belgium' to strike these wartime series, and about four times as much for the Treveran series (Haselgrove 1984). This, in turn, indicates the probable scale of the drain of precious metal out of the region as a result of the war, in unrecovered hoards, in coinage exported to Britain both to purchase mercenary support and as personal wealth taken out by refugees, and as Roman booty and tribute. In these circumstances, the appearance of small-scale gold coinages accompanied by related and far more numerous silver and bronze types, including those inscribed CRICIRV, ROVECA, etc. (Scheers 1977:Nos. 27-29, 30 Class 6), is readily understood as an enforced switch to token coinages, where previously the level of socio-political complexity had generated no need for such coinage.

In the phase of degenerative change which followed defeat (Roymans 1983), bronze coinage rapidly became of great symbolic and practical importance to its issuers, much more so than in central Gaul. These coins provided them with an alternative means of making payments, while at the same time projected their continued authority and reinforced the users' sense of group identity - as shown both in the legends and types employed.

In effect, bronze coinage enabled a mode of integration based on economic necessity and new ideological forms to be substituted for the traditional structures dislocated by the conquest, paving the way for the rapid transformation of Belgic Gaul into a complex and successful province (Haselgrove 1987a).

Before leaving Belgic Gaul, two contrasts with central Gaul may be noted. First, the successive gold coinages in 'Belgium' (generally attributed to the 'Ambiani'; Scheers 1977:Nos. 1-5, 8-9, 24), behave very much as we would predict in the instance where a dominant community gradually expands its hegemony over surrounding territories. Caesar records one individual leader, Diviciacus, tenuously identified with the author of an early inscribed bronze coinage (Scheers 1977:No. 155), as controlling land in Britain as well as extensive territory in Gaul a generation before his time (*BG* II, 4). The emergence of a paramount chiefdom complex by the early first century B.C. is also indicated in the capacity for common action displayed in the scale of the Belgic peoples' response to the Roman threat in 57 B.C. Even in this emergency, die marks on classes of uniface staters of particular weight and fineness (Kent n.d.) indicate tight control being exercised over minting.

Second, the existence of nucleated settlements in the south of Belgic Gaul by the early first century B.C. - both planned fortified sites such as Variscourt and open settlements as at La Cheppe, Mourmelon (Chossenot 1987) - is a reminder of the subtle relationship between settlement growth and socio-political complexity. Although the reasons for the production of pre-Caesarian bronze coinages there and in central Gaul were probably different, the relatively high coin losses on these sites reinforces the need to distinguish the purposes of issuing coins from the uses it can acquire in circulation. Nor should we too readily assume these latter to be convergent in the different zones, despite the apparent inter-regional similarities, until we have clearer evidence of the economic, political and social role of the sites on which they occur.

### (c) Britain

The earlier stages of British Iron Age coinage have an underlying dependence on middle and late phase continental developments. Gold coinage was first imported from Belgic Gaul in quantity in the second century B.C., but was largely confined to the middle Iron Age communities focused on the Thames estuary. These initially had only minimal impact, primarily affecting the spheres of elite alliance and interchange. At some stage, insular potin coinage began to be cast, apparently unrelated to developments in Belgic Gaul, but like there initially in a prestige role (Haselgrove 1987b). Following further importation in the earlier first century B.C., gold coinage began to be struck throughout south-east England soon followed by silver (Allen 1960). The subsequent innovations and contacts which it expresses are confined very largely to the South-East. In the Durotrigian region, coin production never progressed beyond a debased stater system (Haselgrove 1987b). Struck bronze, properly speaking, occurs only in the South-East, its introduction there essentially an extension of developments in Belgic Gaul in the later first century B.C.

The main feature of the period after c. 20 B.C. considered here is the marked Romanization of the coinages of the evolving Eastern and Southern polities, including the use of Roman types and titles (Allen 1944) largely due to treaties established between Augustus and individual British rulers (Haselgrove 1987b; Scheers 1982). The Southern coinage remained bimetallic. So did the more conservative coinages in what became

the territories of the Corieltauvi, the Dobunni and the Icenii, to which areas the use of inscriptions gradually spread from the South-East.

The possible mechanisms behind the process of political centralization and hierarchization in eastern England during the first century A.D. - including the probable role of Roman imports and subsidies in fuelling the expansion of Cunobelinus' kingdom at the expense of its Southern neighbor - are well known (Haselgrove 1982). It remains, therefore, to assess the changes in the coinage system that accompanied these developments, both in this core region and in the peripheral areas beyond.

There was undoubtedly a massive increase in the volume of coinage in circulation in south-east England during the later Iron Age. Alongside the extensive bronze coinages being issued for the first time, the amount of precious metal coinage being struck also increased sharply after a relative lull during the later first century B.C. A conservative estimate of Cunobelinus' gold output is the equivalent of 1,000,000 staters from 100 pairs of dies (Allen 1975), over three times the output of his southern rival, Verica (Allen & Haselgrove 1979). Similarly, in settlement deposits, coins minted c. A.D. 10-40 outnumber those of the period c. 20 B.C. - A.D. 10 by about three to one (Haselgrove 1987b). Almost all of these coins are base-metal issues. The majority of contexts with finds are, in fact, of post-Conquest date, but the trend is more emphatic than enhanced the survival of the later issues could possibly have generated by itself.

The size of individual issues also increased sharply. Cunobelinus' later or 'developed' types (Allen 1967) outnumber earlier issues by nearly two to one in settlement deposits (Haselgrove 1987b). The earlier types, which were produced over a relatively short period, represent nearly two-thirds the combined output of Dubnovellaunus, Tasciovanus and the other rulers of the previous generation. Everything points to an increasingly high circulation velocity. Similar proportions of coins of different phases on nucleated and rural settlements imply a relatively unimpeded flow of coinage between them. The high turnover of bronze coinages attested by their pattern of association in the settlement sequences suggests a high frequency of transactions which led to coin losses (Haselgrove 1987b).

Bronze coinage was possibly increasingly needed as a standard, given the much higher rate and volume of inter-conversions of different commodities which must have followed the opening up of the south-east to Roman trade (Haselgrove 1982; Hodder 1979). Even in the silver-using southern polity, coin losses on settlement sites increased markedly in the early first century A.D., but concentrated on fewer sites, suggesting accompanying socio-political or economic changes.

Unlike Gaul, unitary 'sets' of issues with a range of denominations are frequent. Under Tasciovanus - apparently the first Eastern ruler to achieve a position of paramountcy - several such sets were struck variously linking his name with other colleagues or rulers, or with a particular mint (e.g. Allen 1967). Tasciovanus employed both double and half bronze pieces as well as the usual full set of gold stater and quarter, and silver and bronze units. The southern rulers Verica and his predecessor Tincommius each issued sets of gold and silver units and their quarters. Another ruler Eppillus, who controlled southern land in the middle Thames valley and east Kent before its unification with the Eastern polity, issued separate series in each district. His Kentish issues included bronze, but not his other coinage elsewhere (e.g. Allen 1944). The most sophisticated coinage was Cunobelinus', who issued successive

matching sets in two distinct geographical streams, one issued from Colchester. The other was either struck at Tasciovanus' former mint at St. Albans (Allen 1967) or transported into the region from Colchester (Haselgrove 1987b). The developed series each employ six separate bronze types (Allen 1967). A similar classification can probably be made for the silver, which is as yet poorly represented. As his realm expanded, Cunobelinus apparently at times had dies engraved centrally for subordinates, such as his son Amminius, who was installed as ruler over the previously independent district of Kent. Some British client rulers of the Roman state, such as Tincommius, becoming client kings, were in their turn probably presented with dies by Augustus (Nash 1987), and this dependence of the British coinage system on Rome must not be overlooked.

Allen's (1975) detailed study of Cunobelinus' gold leaves little doubt of the degree of control exercised over his mint, in keeping with cost-control techniques. The gold shows at least five different styles of engraving, the first two employed traditional elements; the third sacrificed quality for quantity, reverting to cruder, almost barbarous techniques; the fourth is back to a traditional style, but with more sense of freedom; and the fifth was probably the work of an engraver with experience of Greek or Roman coin-making. His hand is perceptible too in the high-relief silver and bronze coins of Cunobelinus' developed series (Allen 1975).

Control marks consisting of crosses or dots were added on some gold issues above or below the inscription CAMV, enabling the products of different dies to be readily distinguished. The degree of standardization is also impressive. The average weight and fineness of the coins remain constant throughout Cunobelinus' long reign, with a deviation of no more than between one and two percent, figures which compare well with the output of Roman mints at the time (Allen 1975). The metrological consistency of Verica's gold output is equally impressive.

The symbolic use of their coinages by the client kings of south-east England to reinforce their position, emulating their patron the Roman emperor, bears out the predicted use of coinage as a vehicle for propaganda (Hodges & Cherry 1983). The adoption of a vine leaf on Verica's second stater series as a counterpart of the ear of barley in Cunobelinus' issues has long been recognized as symbolizing their rivalry (Allen 1944). So many coin legends, e.g. COM.F., claim a filial relationship to a previous ruler, real or invented, that this must be seen as a legitimating device. Thus Cunobelinus' western series proclaims him as Tasciovanus' son in the area where the latter previously ruled. His Colchester issues do not (Allen 1967).

Coin types also become more detailed and specific. Cunobelinus' earliest coinage is indigenous in its inspiration and execution, but thereafter, as he consolidated his control over a wider territory, the Roman iconography of victory - winged Victories, palm branches and wreaths - becomes increasingly prominent on both streams of his coinage (Nash 1987). His developed silver and bronze types are heavily Romanized and reflect the varied preoccupations of Iron Age society - craft production, feasting, hunting, mythology and ritual, and warfare.

Both Cunobelinus and Verica use the Roman term REX symbolizing their access to the Roman empire, implicit acknowledgement perhaps of the role of imperial subsidies (Braund 1984) in maintaining their position. The coinage struck by Cunobelinus' associate, Epaticus (when towards the end of his reign, the Eastern kingdom won control over the northern part of its Southern rival), employed Eastern types, but retained the local denominational system (Allen 1944). But in most additions to his



Cunobelinus' regular coinage predominates, the circulation pattern suggesting that it was exported in bulk to the leading settlements from which it subsequently diffused to neighboring rural sites (Haselgrove 1987b).

A number of the changes in south-east England extend to the peripheral coinages beyond. All three main streams of the Icenian coinage show an increase in the size of the individual issues over time (Allen 1970). Half silver units are found there and in the Corieltavian region, where they are much more common and are sometimes accompanied by quarters, but not among the Dobunni. All three groups struck sets of gold and silver issues inscribed by one or more individuals. Each of the inscribed Dobunnic series is internally differentiated by means of die markings, most probably to distinguish either the issue or the issuer (Sellwood 1984). Quantities of silver coin losses occur on settlements in all three regions, while in the Dobunnic area, as in the Southern region, a silver-using 'core area' can be distinguished from a predominantly gold-using 'periphery', implying that the two metals were associated with different kinds of transactions (Sellwood 1984; Haselgrove 1987b).

These regions had a close economic relationship with the South-East, encompassing military predation and peaceful exchange, and bringing material development in return for some loss of autonomy (Haselgrove 1982). It is thus unsurprising that their coinages show signs of a concomitant increase in complexity. In the end, however, the contrast with Cunobelinus' sophisticated coinage suggest that the level of political development was considerably less. The mutually exclusive distributions of the Dobunnic coinages of Anted and Eisu or Corio and Bodvoc (Sellwood 1984) suggests separate territories and rulers. The pairs of names (in one case three) inscribed on the different Corieltavian coinage sets again suggest more than one ruler, while the Iceni apparently had three separate subdivisions (Allen 1970); discontinuities in the coin distributions suggest that there were also extensive boundary zones between the most populated areas (Kimes et al. 1982; cf. Fig. 1 above).

These territorial subunits suggest forms of political organization very different from the unitary domain implicit in the extensive distribution of Cunobelinus' coinage and the related composition of settlement assemblages from opposite extremes of his realm (Haselgrove 1987b). The clear message of centralized political authority embodied in the standardized sets and symbolism of Cunobelinus' coinage is nowhere to be found in the conservative repertoire of its peripheral counterparts. Coinage and archaeological evidence agree that under Cunobelinus, the Eastern kingdom achieved a new measure of political centralization and socio-economic differentiation. The Roman invasion, however, followed Cunobelinus' death too quickly for us to assess whether the kingdom's institutional development had kept sufficient pace with its unparalleled territorial expansion for it to have held together permanently once the king's personal influence had been removed, although the increasing sophistication of the coinage system is one pointer that it had.

## Conclusions

A lack of the requisite numismatic data in some of the regions, and their uneven quality and quantity in the other case studies permits only preliminary discussion of Hodges and Cherry's (1983) propositions and the relevance of the 'cost-control' model to Iron Age Europe. Even so, the results obtained here imply shortcomings in conventional wisdom about the nature of the socio-political and economic developments taking place. Only in eastern England does the elaboration of the coinage system match the

full trajectory predicted for the evolution of a more complex and hierarchical polity. In most cases the implementation of cost-control techniques over coin-production is more obviously a function of the external shock of the Roman Conquest, than a response to internal differentiation and hierarchical growth. This is particularly true of Belgic Gaul.

On the basis of coin use, the case for state formation in central Gaul has been overstated (Nash 1976, 1978a). None of the regions examined possessed pre-Conquest coinages integrating polities of a comparable scale to the later *civitas* territories, although some peoples may have established regional hegemonies, as in 'Belgium'. However, in some more circumscribed regions, the behavior of the earlier first century B.C. coinages does suggest the development of more complex polities. These include the Limagne, the Berry limestone plateau, and the territory of the Remi, who with Roman support emerged as one of the paramount peoples of Gaul (BG VI, 12). These areas are all situated close to the edges of the main distribution of early cast bronze coinage, focused on the agriculturally rich plains of eastern-central Gaul (Allen & Nash 1980, Map 17), and occupied in part by the other two paramount communities mentioned by Caesar (BG VI, 12) - the Aedui and the Sequani (whom the Remi displaced).

The widespread adoption of bronze coinage is readily comprehensible in these more circumscribed areas of higher population density and settlement nucleation, especially given the volume of Roman trade and diplomacy to which they were exposed from the later second century B.C. onwards (e.g. Collis 1984). In effect, the uses which bronze acquired in circulation mark the beginnings of a process of monetarization of the economy, which subsequently proved advantageous to elite leaderships throughout Gaul under the stresses generated by the Roman Conquest.

Initially, however, the more economically advanced polities in which bronze coinages were used were still relatively small-scale, with production to serve purely local needs, although close copying of each others' issues and the most prestigious types (e.g. at La Cheppe; Chossenot 1987), must have eased wider regional transactions. Even the most highly organized late Iron Age polities in Gaul were probably little more than islands of greater complexity focused on the best agricultural land, separated by boundary zones or even larger expanses of lower population density, such as the Massif Central, with which they had few links until their subsequent territorial unification in the Augustan reorganization of the province. This brought together these former core and peripheral areas on a largely expedient basis, a process facilitated by the shift towards more directly economic forms of integration, which had occurred in the meantime with the vastly increased use of base metal coinages.

There is an obvious contrast with Cunobelinus' kingdom a century later, which was centrally providing a supply of base metal coinage to all its constituent parts. This and the circulation dynamics of his coinage suggest royal interest in the regulation of market place activity throughout his domain with the benefits that thus accrued to the central authority. A fruitful comparison could well be made with the highly regulated market system developed in Anglo-Saxon England by King Alfred and his successors which provided them with an important part of the infrastructure needed to maintain a unified state (Hodges & Cherry 1983).

There is, however, a limit to what can be learnt of past societies from examining coinage in isolation - the accompanying changes in the settlement pattern and in the structures of production and exchange must also be considered in detail. Nevertheless, applied to coinage, the

'cost-control' model provides a useful new perspective. Through specifying the changes to be expected in a coinage system concomitant with increasing socio-political complexity, this approach requires us to analyze the numismatic evidence more rigorously and to examine the causes of variation in specific cases.

The particular theoretical base can, of course, be challenged, but the framework is still useful in pointing the way to the quality and quantity of information which will be necessary to take our investigations appreciably further. Even from relatively poor data, it is clear that the observed numismatic changes do not conform to the patterns predicted of emergent large-scale complex societies, despite most archaeologists accepting their having evolved in Temperate Europe at this period. A comparative generalizing approach to the coinage clearly can refine and compliment the results yielded by established inductive methodologies and thus increase our knowledge of the economic, political and social processes shaping the character of later Iron Age Europe.

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## A SPATIAL APPROACH TO SOCIOECONOMIC CHANGE IN SCANDINAVIA:

### CENTRAL SWEDEN IN THE FIRST MILLENNIUM B.C.

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#### Introduction

During the first millennium B.C., in particular the period 800 B.C. - B.C./A.D., great processes of change seem to have been in operation in many parts of Scandinavia (cf. Jensen 1982:198ff; Kristiansen 1984:95; Larsson 1986:180ff). Throughout Scandinavia there are archaeological indications of change in, for example, settlement pattern, land use and mortuary practice which reflect change in socioeconomic complexity during this period. In central Sweden, where preservation conditions have been very favorable compared with, for example south Sweden and Denmark, this process of change can be studied in great detail. The transformation of the Late Bronze Age socioeconomic system to the 'new' Early Iron Age system that is observable in the archaeological record from the centuries around the year 0 will be analyzed and discussed in terms of *production*, *reproduction*, and *organization*.

As in my earlier works (Larsson 1984a, 1984b, 1986) the theoretical position has been derived from Marxist theory to a great extent; in particular the works of Bloch (1975, 1977), Hindness and Hirst (1975), and Friedman (1975). In analyzing social complexity and social change *production* and *reproduction* become two important concepts, relating to both the economic and ideological spheres of society. The social organization of production and the organization of social reproduction are products of human action, which, in a state of socioeconomic change are the key variables (Larsson 1986:14). In this sense production and reproduction and the human action involved can be considered to be the motor in social evolution.

Taking the discussion a step further, I would like to argue that human action related to both the productive and reproductive domains, is to a great extent the product of conflicts and contradictions between individuals and groups with different interests (as stressed by Rey 1977; for a more elaborate discussion see also Larsson 1986:14f). Taken in a very straight-forward and mechanical fashion, the relationship between production and reproduction could be seen as a process operating between a certain mode of production and the different ways in which this mode of production is 'secured' and reproduced over time; this is the 'base-superstructure' theory. Certain economic, social, and political structures



can be both legitimized and stabilized by reproductive structures, which also actively involve ideology (Shanks & Tilley 1982:130ff).

The aim of this paper is to discuss the socioeconomic changes occurring in central Sweden - the province of East Götaland (Östergötland) (Fig. 1) - where the data base is extremely rich in archaeological remains from this phase in prehistory. This does not, however, imply that the conclusions drawn from this study are not of more general interest from a Scandinavian perspective. On the contrary, the archaeological record from other regions and areas in Scandinavia indicate that similar processes were taking place, though the structures are not as always 'clear-cut' as here, making East Götaland a suitable model region.

### The Settlement Pattern of the Late Bronze Age

The central Swedish area (Fig. 1) is very rich in Late Bronze Age settlement indicators, marked in the terrain by the so-called *skärvtens-*

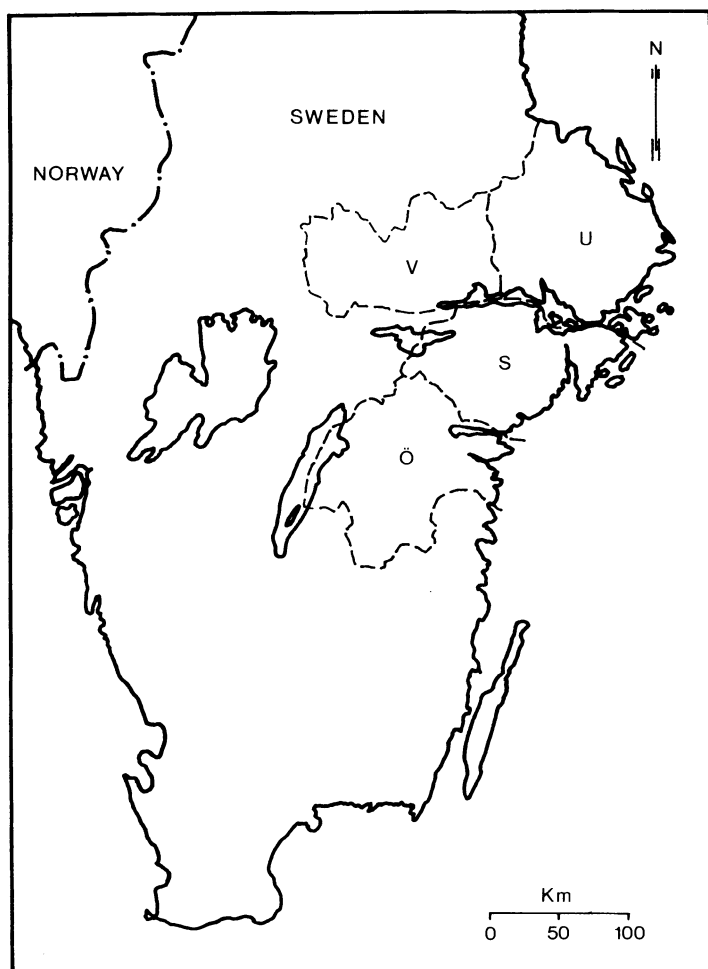


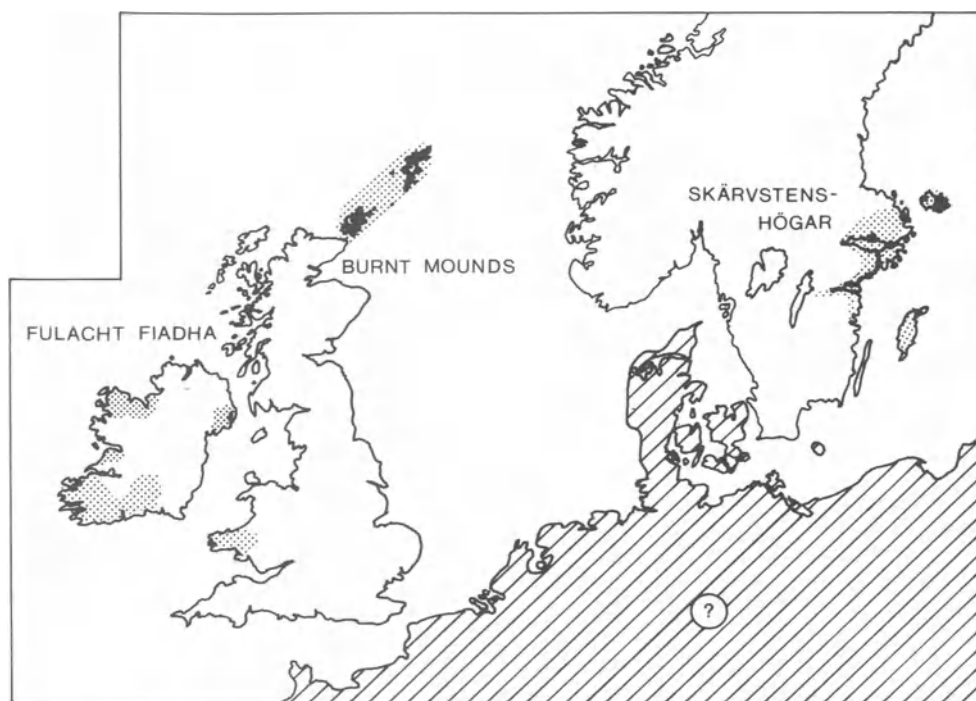
Figure 1. Map of southern and central Sweden with the provinces of Västmanland (V), Uppland (U), Södermanland (S) and Östergötland (Ö) marked.

*högar* (Fig. 2), which are more or less identical with the 'burnt mounds' of Britain and the *fulacht fiadha* of Ireland (Barfield & Hodder 1981; Buckley 1983; Hedges 1977; O'Kelly 1954; see Fig. 3). Altogether, c. 6000 individual mounds of this type are known and have been mapped within the four Swedish provinces marked in figure 1, and the figure for north and northwestern Europe as a whole is around 11,000.

As in Britain and Ireland, these mounds consist of a mixture of charcoal, earth, and fire-cracked and burnt stones which are directly related to cooking and heating activities on the dwelling sites (cf. Lerche 1969). Together with the charcoal, carbonized organic materials, soot and ashes from the hearths, fire-cracked stones and animal bones, the mounds also contain pottery sherds, and in some cases also casting molds and crucibles. Excavations have shown that the regularly appearing small cluster of these mounds, usually 3-7 within an area of c. 500 - 1000 square meters, are in fact refuse dumps located in close proximity to houses from the late Middle and Late Bronze Ages (Hyenstrand 1968; Jaanusson 1981; Tesch 1983). The houses are rectangular, c. 10-17 x 5-7 meters in size, with internal roof-supporting posts. This rectangular three-aisled house type is very characteristic of the south Scandinavian Bronze and Iron Ages (Boas 1983; Näsman 1987). The eleven radiocarbon samples from the province of East Götaland dated by the accelerator technique (Possnert & Olsson 1986), clearly underline the relevance of this general dating (Fig. 4).



**Figure 2.** A burnt mound (*skärvstenshög* in Swedish) from the province of Östergötland during excavation. Photo: *The Central Board of National Antiquities*.

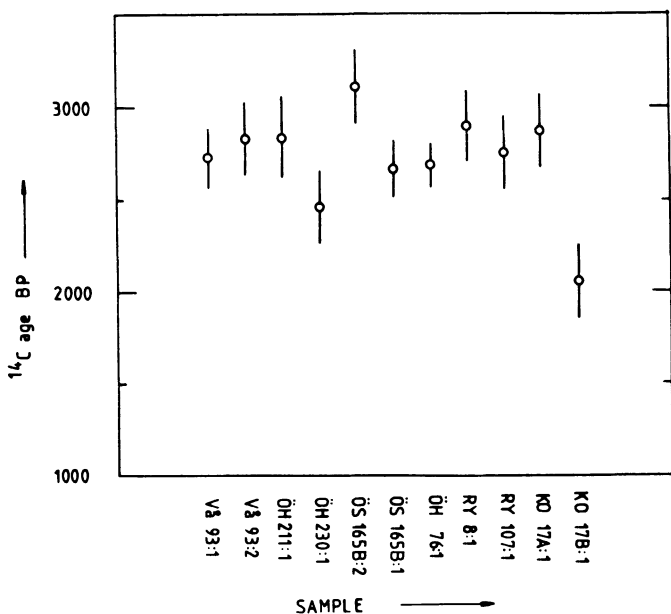


**Figure 3.** The distribution of mounds of cooking-stones in northern and northwestern Europe. Shaded areas mark concentrations and diagonal hatching indicates the area not investigated by the author.

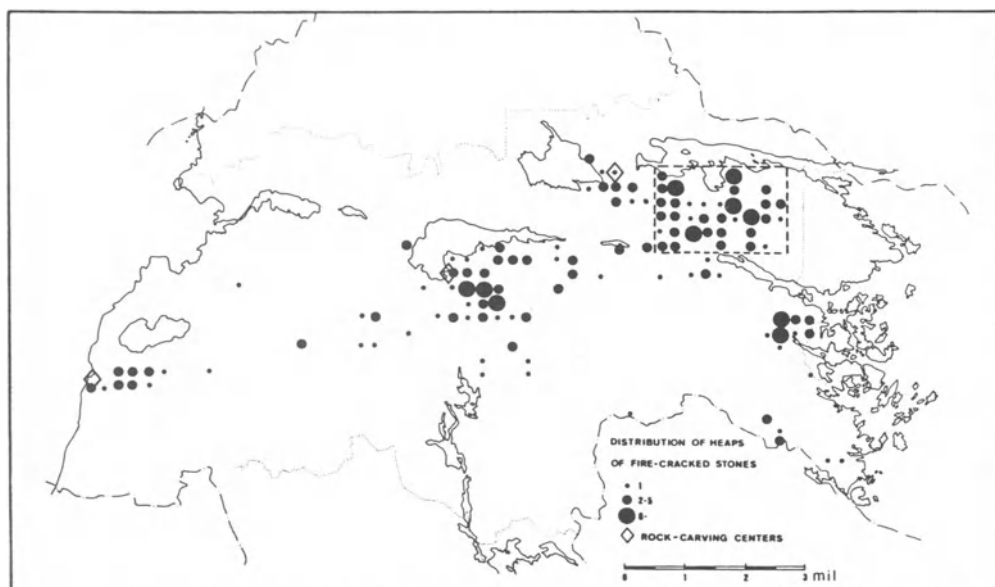
The spatial structure evidenced by the distribution of mounds gives a good picture of the Late Bronze Age settlement pattern. From Figure 5 four clusters of settlement can be identified: (1) a small concentration in the western part of the province, (2) a rather large agglomeration south of Lake Roxen in the central part of the province, (3) another large agglomeration of settlement indicators in the western part of the peninsula of Vikbolandet (segregated by a dashed frame), and, finally, (4) a small cluster in the coastal zone of the eastern part of the province.

Because of the great similarity in the history and intensity of cultivation over the entire plain-belt that stretches from west to east that encompasses settlement clusters 1-3, the empty areas in-between can be regarded as 'real' buffer-zones between the different communities or sub-sections in the socio-spatial organization of society. The social significance of these buffer-zones is even more credible if we add the observation that the physical landscape, and hence, the economic potential is very homogenous over the entire area.

There are, of course, smaller variations *within* each of the four clusters with respect to soil types and geology, which are important to studies at the inter-cluster level of analysis. This will be demonstrated in greater detail when discussing the change in settlement pattern occurring at the end of the first millennium B.C. However, at this stage we can say with great certainty that the settlement pattern shown in figure 5 reflects spatial organization during the Bronze Age. Because spatial organization can never be separated from social, political, and



**Figure 4.** Radiocarbon dating of charcoal from burnt mounds in Östergötland dated by accelerator technique (after Possnert & Olsson 1986).



**Figure 5.** The distribution of burnt mounds Östergötland. Each dot marks 1, 2-5, and 6- dwelling sites per 6.25 square kilometers. The diamonds denote rock art centers.

economic organization I find it appropriate to relate the pattern to a certain level of socio-economic complexity - a pattern of complexity characteristic of the Late Bronze Age.

Because distribution maps give different information depending on the scale used, it might be of relevance to examine one of the four clusters in greater detail. Figure 6 is a magnification of the area marked by the dashed box in figure 5 - the central and western parts of the peninsula of Vikbolandet. Each dot on the map marks one smaller cluster of c. 3-7 individual mounds (one dwelling site) and the horizontally hatched areas indicate the water level around 500 B.C. It should be pointed out that the rate of isostatic uplift in this part of the world today is c. 40cm per 100 years. Therefore, the shoreline around 500 B.C. was about 10m higher than it is today - a fact that must always be taken into consideration when dealing with the distribution patterns of bronze-age remains. The two narrow bays visible on the map almost made the eastern part of the peninsula an island during the Late Bronze Age. Perhaps it is more correct to say that the eastern part of the peninsula was an island during the Late Neolithic and Early Bronze Age, and that this island was beginning to join up with the mainland during the mid-first millennium B.C.

The very flat character of the landscape in this area further indicates that large parts between the settlement clusters were very damp and seasonally water-logged during this period of prehistory. This must have had an impact on the subsistence economy as well as on the spatial organization of society. The settlements are located on the small and flat moraine hills that penetrate into the wet lowland clays that dominate the scene.

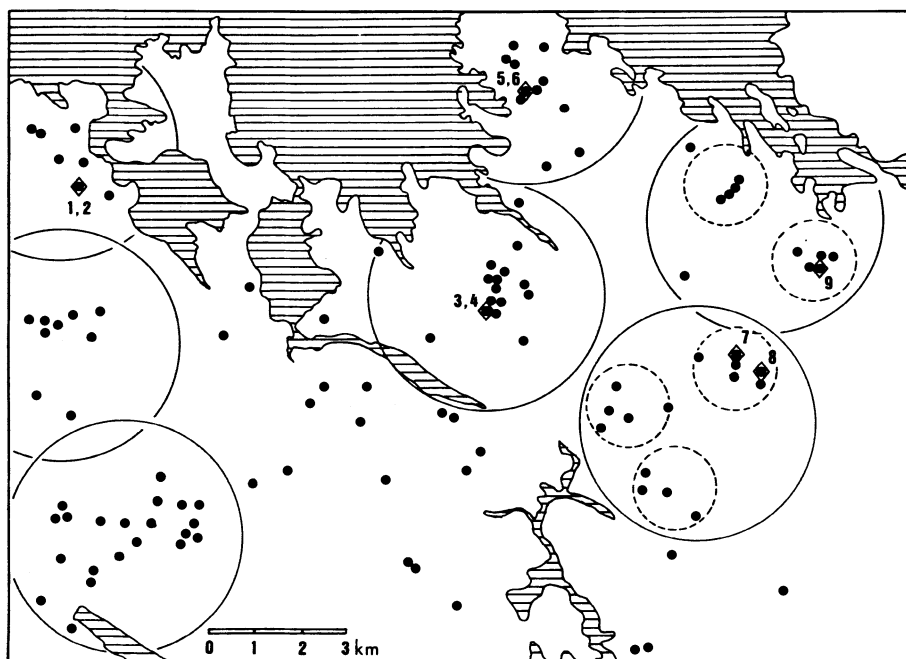


Figure 6. The distribution of burnt mounds on the peninsula of Vikbolandet (the dashed box in Fig. 5). The diamonds show the sites from which C-14 samples have been analysed.

At this level of detail it is quite easy to identify internal clusters of settlements. These are marked by full circles. The clusters are directly recognizable if the new type of D-curve analysis developed by Lundmark for identifying hierarchical structures in distribution patterns is used (Lundmark 1984a:19f; Sinclair & Lundmark 1985). The seven settlement clusters are composed of 7, 9, 11, 11, 15, 16 and 21 Late Bronze Age sites respectively; adding up to a total of c. 350 individual *skärvstenshögar*. In the central part of the map between the two bays, where the picture indicates a more dispersed pattern, there are a further 17 sites. How these dispersed settlements should be interpreted in relation to the agglomerated ones is, of course, an interesting problem. Do they represent a certain chronological horizon within the Late Bronze Age or should they be ascribed a particular function which differs from that of the clustered settlements, or do they indicate temporary huts used by shepherds? At this point in time, we do not know for certain.

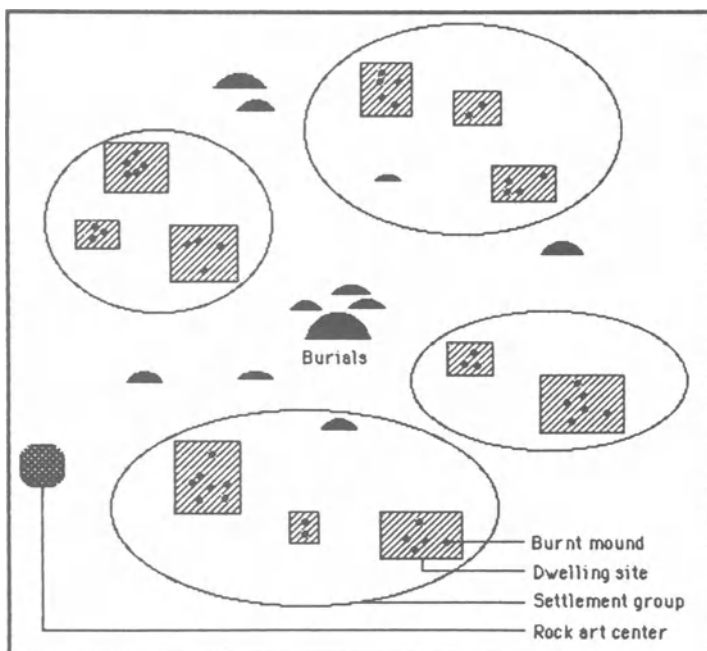
The five dashed circles mark a possible third level of organization in this settlement hierarchy. These smaller clusters were also clearly identified in Lundmark's analysis of this area, which divided the two easternmost concentrations into two and three smaller clusters respectively (Lundmark 1984a: Fig. 10a).

### **Settlements and Burials: Spatial Relationships**

The stone-built cairn is the most characteristic visible grave-type of the Bronze Age in central Sweden (Hyenstrand 1979:137). Cairns are also very common in the west and north Swedish coastal zones, as well as in Norway and Finland. This widespread distribution over large parts of Scandinavia suggests that this type of grave structure was more related to a common cultural heritage than to inter-societal communication. The manner of grave construction (in this case, graves of cairn-type) can be similar throughout a large area, but the local adaptation and specific role of this tradition may vary according to differences in, for example, social structure and organization; the reproductive power ascribed to a cairn burial would be expected to vary depending on the local socio-economic complexity. With respect to the common praxis of the placement of the dead in cairns, the societal meaning and reproductive function of prehistoric mortuary practices and grave structures may have been totally different for hunter-fishers along the northern coast as opposed to sedentary farmers in central Sweden.

Turning to the spatial relationship between the settlements and cairn burials of Late Bronze Age date, it can be said that the two patterns do not overlap. The burials are not located in close proximity to the settlement clusters. Instead, the majority of them seem to have been built at a distance of 2-4 km away from the clusters of settlements (Larsson 1984a:27f). Figure 7 illustrates, in a schematic way, the observed spatial relationship between the settlement structure (hierarchy) and the burial centers in this part of Sweden. The hierarchical nature of the settlement organization - from the individual mounds to a group of 2-5 such clusters forming a larger unit consisting of 4-6 groups - is also revealed by this model. The spatial position of the burial cairns in this settlement hierarchy suggests that they 'functioned' at the group level.

About 75% of the known Late Bronze Age burial structures in this area are to be found in this 'buffer-zone position' - at junction points at half-distance between surrounding groups of settlements. Therefore, the burials are, from a spatial perspective, more strongly related to a territory larger than that of the single household or single group of households. It is very tempting to interpret these 'buffer-zone burials'



**Figure 7.** A spatial model of Late Bronze Age organization and land use in central Sweden.

as *nodes* in the socio-religious network. The burial structures were the concern of four to six settlement groups with a high degree of social and economic interaction.

Using a social anthropological 'check list', a *tribal* mode of social organization would perhaps be the most relevant level of socioeconomic complexity to attribute to these archaeological complexes. The 'segmentary lineage system' or the 'conical clan' structure, as discussed by Sahlins (1968:49-52), would perhaps be the most relevant here if we are to interpret this particular spatial configuration, i.e. the relationship between settlements and burials, in terms of production. It is possible that land for pasture and agriculture were to a large extent tribal or community property rather than existing exclusively in the hands of the households and settlement groups. During this phase of prehistory there are no indications whatsoever in central Sweden that land or other natural resources were private or household property. This tribal or large-scale pattern of organization, with a subdivision into smaller segments like clans or lineages that are territorially definable, does not require chieftainship nor any other form of institutionalized political leadership, 'but only the capacity to fashion temporary versions of these in a time of stress.' (Sahlins 1968:51).

A very popular thing in Scandinavian research during the last decades has been to characterize Bronze Age society as organized into *chiefdoms* (e.g. Johansen 1981; Kristiansen 1981, 1984; Welinder 1977). This model of stratified chiefdom social structure has been generated mainly through analyses of bronze artifacts, deposited either in burials or as hoards. It has also been by tradition the rich material from south Scandinavia (Denmark and Scandia in particular) that has been the basis for this chiefdom model. For central and northern Sweden, Norway or Finland, the

relevance of this model can not be automatically accepted or tested in the same way due to the relative paucity of bronze artifacts.

Broadbent, for example, is critical of the ways in which Scandinavian archaeologists have reached their conclusions, and argues that the Bronze Age archaeological remains can be fitted to a 'big man' model as well as to the popular chiefdom model:

"The archaeologists have proceeded from physical remains to define social rank, chiefs, and political and economic relations and yet almost no attempt has been made to define what is meant by these expressions. Rather than beginning with a well-defined array of social models to be tested using archaeological remains, ready-made social relations have been produced from the archaeological data." (Broadbent 1983:8)

In central Sweden a segmentary tribal structure without chiefly families in control is a quite relevant and possible alternative to the commonly adopted chiefdom model. Compared to Denmark and south Sweden where the Late Bronze Age settlement structure at a large scale is very difficult to grasp, central Sweden is a part of Scandinavia where this pattern is preserved in great detail over thousands of square kilometers of land, though the bronze artifacts are comparatively few.

When making statements about social structure and organization in Bronze Age Scandinavia, it is very important to remember the great variation in modern land use between different regions such as the southern, central, and northern parts. This fact must be taken into consideration before any attempt is made to discuss prehistoric remains of any kind in societal terms.

Apart from this there are also variations in the archaeological record that can be linked with certain conditions which arose in the course of prehistory. For example, the relative lack of bronze artifacts north of Denmark and south Sweden is something that is most certainly related to *exchange systems* and *alliances* during the Bronze Age (Larsson 1986:83ff). The peripheral role in the bronze exchange system of, for example, the province of East Götaland dealt with in this paper might be an indication of differences in social structure compared to south Sweden and Denmark. The need for display-objects of bronze as material attributes of rank and power seems logical in a society of chiefdom type; but in a less complex segmentary tribal system, these prestige objects may have had lower social significance - therefore the relative shortage of bronzes in the archaeological record of central Sweden.

Whether we label the social formation during the Late Bronze Age in central Sweden chiefdom or tribe is of less interest than the fact that the relations of production were not replaced in the same manner here as in the southern parts of Scandinavia, i.e. by the active use of bronze objects as individual attributes of power and prestige. Surplus produced was not exclusively appropriated by a small elite, but was instead distributed over a larger part of the population. It was not transformed by exchange into display artifacts as in the south.

## Bronze Hoards and Rock Art

The Bronze Age hoards of Scandinavia have been analyzed by many scholars and from different perspectives (e.g. Aner 1956; Baudou 1960; Larsson 1986; Levy 1982; Willroth 1985). Looking briefly at archaeological studies of hoards in northern Europe, particularly those of the Bronze



Age, several subdivisions have been suggested; like 'founder hoards', 'merchant's hoards', '*Opferfunde*', '*Schatzfunde*', and 'ritual' and 'non-ritual' hoards (cf. Bradley 1985). The distinction between hoards deposited as votive gifts to the supernatural and hoards that represent temporary hidden treasures is very difficult to draw. In her study of the Danish Bronze Age hoards, Janet Levy tries to formulate certain criteria for ritual and non-ritual hoards, based on whether the hoards were deposited in a wet or dry context (Levy 1982:24). An interpretation of the hoards as all being votive deposits, irrespective of whether they are found in wet swamps or in well-drained sandy soils, has been advocated by Willroth (1985:243).

In central Sweden there are c. 30 hoards from the Late Bronze Age (Larsson 1986:171) and, like most of the hoards in Scandinavia, they are not found at settlement sites, but in rather peripheral parts of the territory. This observation supports the ritual-symbolic significance of the hoards, rather than being just a casual collection of utilitarian material. As with the placing of the dead in cairns away from the settlement sites, the hoarding activity was also something of a 'peripheral' phenomenon, perhaps carried out at sacred places far from the settlements.

This type of spatial arrangement is also very evident if one considers the location of Bronze Age rock art (Figures 5 and 7). When dealing with rock art, one must differentiate between two broad categories: (1) pictures of ships, swords, axes, feet, humans, animals, etc., and (2) cup marks. The first category is always concentrated in a particular spot in the terrain, while the second one is rather evenly spread over the settled area, showing a high spatial correlation with the burnt mounds.

The two types of rock art could have been directed towards two different levels of society - individuals and the local dwellings on one hand, and the entire clan or sub-tribe on the other. Instead of being located in places central to the settlement structure, the rock art centers (category 1) in East Götaland are all lying in the western periphery of the settled areas.

If the spatial distribution of burials, hoards, and rock art centers is related to the settlement pattern indicated by the burnt mounds, it is rather clear that the socio-cultural human activities represented by these remains involved rather large groups of people, far beyond the family or household level of organization. If the mortuary rites and the building of burial cairns were the concern of 3-4 settlement groups (perhaps 200-300 people), each rock art center might have been the meeting place for 10-15 settlement groups (c. 1000-1200 people), forming a larger social unit like a clan or sub-tribe (Larsson 1986:157).

Irrespective of whether these social units were clans or sub-tribes according to a social anthropological check-list, or something else, I find the comparison quite relevant when trying to relate certain patterns in archaeological data to known forms of human organization. The importance of the larger group compared to the single family is very evident when analyzing the Late Bronze Age data. This large-scale structure is transformed into a small-scale pattern during the end of the first millennium B.C., clearly visible in the archaeological record from around 100 B.C.

## Socioeconomic Patterns and Change

The large-scale pattern of social organization that we have discussed for the Late Bronze Age, with burials, hoards and rock art centers as representatives of social communication at different levels, utilizing families, lineages, clans etc., seems to undergo a dramatic change around 400-100 B.C. This transformation of society is not only visible in the changed use of material culture (from bronze to iron), but also in remains of a more economic nature - the use and exploitation of the physical landscape.

The most significant relationship for Late Bronze Age central Sweden is to be found between the settlement clusters and damp clay basins (Bertilsson & Larsson 1985; Larsson 1986:155f). This is very notable in the province of East Götaland (Fig. 5). The western settlement cluster is located immediately south of the flat plain south of Lake Tåkern. The central cluster lies on the clay plain south of Lake Roxen. The large cluster on the peninsula of Vikbolandet is penetrated by bays and wetlands and, finally, the smaller group along the coast is located at the bottom of a narrow bay, with wet clay sediments as the predominant soil-type.

The economic potential of these wetlands must have been related to an economy based on extensive cattle rearing - a *pastoral* mode of production. This general hypothesis fits together very well with the observations made when excavating burnt mounds. They contain rather large amounts of animal bones; mainly cattle and sheep (Hyenstrand 1968; Kjellen & Hyenstrand 1977).

The great importance of the natural wetlands, fertilized by the nutritious spring floods, as the earliest type of pasture and meadow in Sweden has for long been advocated by human geographers (e.g. Aronsson 1979). The access to highly productive natural grass vegetation and water - prerequisites for a pastoral mode of production - were most favorable in the specific areas where we find the clusters of burnt mounds. This is surely no coincidence.

The pattern evident from figure 5 is therefore dependant on both the *physical landscape* (the best ecological zones for extensive grazing) and *social organization* (giving each group enough land for living and moving the herds). In some cases the rather large zones without settlements between the clusters shown in figure 5 are as suitable for grazing as the area within the clusters, which might be an indication of the strong need for quite large buffer zones between the different communities - something rather typical of pastoralists (cf. Orme 1981:109; Sherratt 1981:298).

Because of the total lack of evidence for regulated land use, like enclosures or boundary walls, the Late Bronze Age production system must have been very open and extensive. Cattle and sheep might have been allowed to move around in large herds within the four settlement clusters in the province. In line with the earlier stated hypothesis of a large-scale social system with the clan or subtribe as the most important socioeconomic instance of society, it is further likely that production and ownership were also related to these levels of social organization.

The communally-based production system was ideologically reproduced by, among other things, the mortuary rites and the burying of the dead on communal land shared by the entire group involved in the production process. The votive deposits out on the wet parts of the pastures can also be interpreted as a communal 'destruction' of property, intended for the supernatural forces or water gods, with the objective of securing good and stable access to water and pasture lands for the cattle. The economy and

the communal mode of production were thus reproduced by rites and ideas relating to burials and hoards. The old Marxist theory of 'base and superstructure' can be fruitfully used as an explanatory framework.

According to archaeological dating and C-14 samples from excavated sites in central Sweden, this socioeconomic system disappears during the period 400-100 B.C. From this phase of prehistory there are no specific patterns in settlement and burial. It seems to be a period of profound societal transformation - from one rather distinct structure to another leaving very few traces in the archaeological record.

It is only during the middle of the first century B.C. that a new structure first becomes apparent, which has been formed and consolidated in a way that makes it 'readable' in archaeological terms. The gap between c.400-100 B.C. in the archaeological record could be a logical consequence of this transformation. When conditions transform from one stage to another in a relatively short period of time (from an archaeological perspective), the archaeological record becomes too small and fragmentary to form significant structures. We can only observe what was *before* and what came *after*, because these structures are the result of long-term processes operating for some 600-800 years without major changes. Of course, there are remains from this period of change, like urn burials and particular brooches and other artifacts found at excavations, but it is quite impossible to make any statements about *patterns* in settlement, burial, ritual, etc..

The 'new' pattern that emerges out of the transformational process is characterized by what we can call 'small-scale structure' (compared to the previous Late Bronze Age 'large-scale structure'). The individual farmstead - an extended family - has now become the most important basic unit in production and social organization. In the archaeological record of East Götaland this focus on the family and the individual farmstead can be seen in the distribution of farmsteads, burial grounds, and boundary-walls of stone. This particular type of boundary-wall, which in construction is rather similar to the 'reaves' of Dartmoor discussed by Fleming (1979, 1983), has been excavated by archaeologists and human geographers (Baudou 1973; Lindquist 1968). The dates for these walls range between c. 100 B.C. to 500 A.D. (Widgren 1983). In the province of East Götaland alone there are registered more than 450 kilometers of Early Iron Age boundary-walls (Winberg 1986). The analyses of the boundary-wall landscape carried out by human geographers have shown that these walls were built to divide land into different categories; like pastures, meadows and fields for arable farming (Widgren 1983:18). The single farmstead as the basic socioeconomic unit is very clear from these studies, even if parts of the landscape were still used by a larger unit (2-4 farmsteads):

"The single farmstead with its intensively tilled arable land formed the basic element in the system...Many farms had a share in the same infield and the pastures were used in common and were probably shared between the different complexes." (Widgren 1983:116).

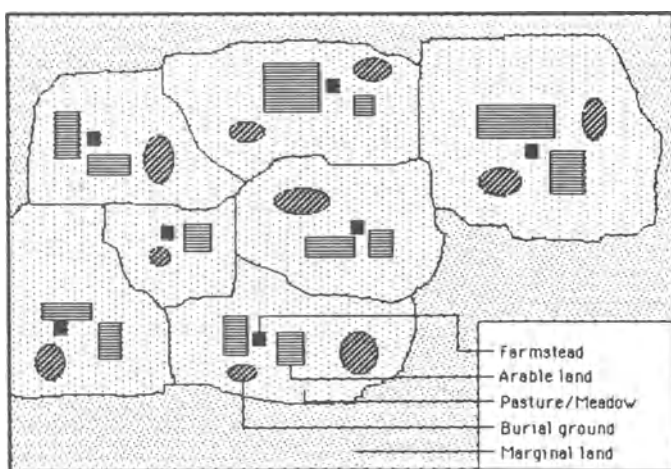
In contrast to the Late Bronze Age, the Early Iron Age economy was based more on division of land and, consequently, a more differentiated land use. The growing importance of arable farming is one cause for this development, requiring fences to keep the animals away from the crops. Also, the climatic deterioration that occurs in Scandinavia around 500 B.C. (Berglund 1983; Jensen 1982:136) brings two new elements into the picture: the need for meadows and winter fodder, and the need to stall the cattle during the cold months of the year. The archaeological evidence of stalling in Scandinavia dates from the middle of the first millennium A.D.

(Myrdal 1984), showing a good correlation with the change to wetter and cooler conditions.

Figure 8 shows in a schematic way this socioeconomic structure. Arable land, pastures, meadows and burial grounds are all spatially arranged with the single farmstead as nucleus. Both food production and the burying of the dead were now tasks that related to the family level of organization; each family had their own farmstead with associated lands, where they had their own family burial ground. The burial structures from this period consist of flat mounds which are round, square, rectangular and triangular in shape; usually grouped together to form burial grounds. The standing stone is another characteristic monument type of this period, indicating an Early Iron Age cremation burial.

When comparing figures 7 and 8, the difference between the Late Bronze Age 'large scale structure' and the Early Iron Age 'small scale structure' is easily seen. In terms of relative scale, 3-4 Early Iron Age structures could well be fitted into one of the Late Bronze Age settlement groups. If we were to compare the sizes of the units of production (settlement groups vs. farmstead territories) in square kilometers, the Late Bronze Age system is c. 20-30 sq. km and the Early Iron Age system c 3-7 sq. km, a reduction in size by a factor of 5.

To sum up, the average Early Iron Age farm in central Sweden intensively exploited c. 5 km of land, and production was based on a mixture of arable farming and cattle rearing. The houses were usually three-aisled structures, c. 30 x 8 meters in size (Myhre 1980; Stenberger et al. 1955) with two internal rows of roof-supporting posts and one or two entrances on the long sides. In many cases a third of the internal area was used as a stable. Close to the farm house we also find the family burial ground, usually within a radius of 200-300 meters. In many cases there are more than one burial ground in close proximity to the settlement. This complex is then surrounded by a network of boundary-walls, indicating the areas used for cultivation, pasture and meadow. Of course, this structure is not fully preserved in too many areas of central Sweden due to modern land use and exploitation, but in parts of the province of East Götaland the pattern is quite distinct.

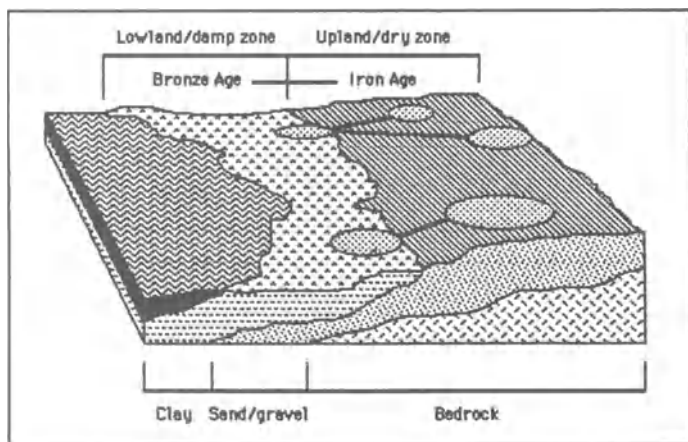


**Figure 8.** A spatial model of Early Iron Age organization in eastern central Sweden.

The last observation that must be added when discussing the difference between Late Bronze Age and Early Iron Age socioeconomic structures is directly linked to the change in land use and the increased importance of arable farming. When mapping burnt mounds and boundary-walls, it is notable that the two types seldom appear at the same physiographic setting. Generally, the Bronze Age settlements are situated at lower levels than the settlements from the Early Iron Age. There is a shift in location between the two periods - a movement from the damp clay zone to the drier upland moraines (Fig. 9).

An economy largely based upon cereal production (and farming) requires rather well-drained soils, while the primary requirement for the pastoral economy is land with a high rate of grass production, in this case the clay basins near lakes and shallow bays. The change in settlement location is therefore a result of economic changes relating to food production.

Turning to the distribution of the Early Iron Age burial grounds with which the farmsteads can be identified, a similar change is notable. Also, the entire settlement structure; i.e. site organization in a hierarchical manner and settlement density, is different from that of the Late Bronze Age. Lundmark's D-curve analyses of the settlement patterns in East Götaland during the two succeeding periods has discerned a significant change (Lundmark 1984b:52ff). Many of the 'gaps' between the Late Bronze Age settlement groups (where cairns are numerous) have been settled during the Early Iron Age. The 'new' differentiated land use and the increased role of cereals, requiring better soils, was the force behind this reorganization.



**Figure 9.** Block diagram illustrating the shift in settlement location occurring in the late first millennium B.C., in relation to topography and geology.

## Socioeconomic Change: Concluding Discussion

The overall socioeconomic change that I have briefly presented and discussed above can be summarized as follows:

*First*, changes in the economic base from a pastoral mode of production to an economy increasingly dependant upon grain production.

*Second*, a change in social organization and complexity; from an emphasis placed upon kinship groups and rather large social units, to the extended family as the socioeconomic unit.

*Third*, an increase in the importance of territoriality and the ownership of land and resources as an effect of the changed economic basis and the greater importance laid on the smaller social group, such as the local family.

Adopting a spatial perspective combined with a materialistic socio-theoretical approach, and using the available prehistoric remains in central Sweden from the first millennium B.C., the change that is clearly 'visible' in the data is very tempting to interpret as a transformation from collective to private, and from tribal to familiar. The change in the organization of production into smaller farming units could not be carried out in isolation, that is, without a simultaneous change in ideology. This implies a change in which the prehistoric people's perspective of the 'world' decreased from the larger tribe or lineage to the family and its local network of relations. The care of the ancestors as indicated by the spatial placing of burial grounds supports this interpretation. The size of the burial constructions also points in the very same direction - from the large collectively-built Bronze Age structures to the small, labor-saving flat mounds of the Early Iron Age.

Changed relations of production resulted in changes in the reproductive sphere of society, because the new socioeconomic relations had to be justified and legitimated also in the *minds* of the people, not only in the immediate labor process. The way people treated their dead is just one piece of the ideological 'cake', which can be studied in the archaeological record.

The rich material from central Sweden briefly presented in this paper is to a large extent the result of the many decades of work by the Central Board of National Antiquities. The majority of the burnt mounds and the boundary-walls, however, were not registered until the late 1970's, which means that more field-work and analyses still have to be carried out before a fuller understanding of the transformational processes in the late first millennium B.C. can be reached.

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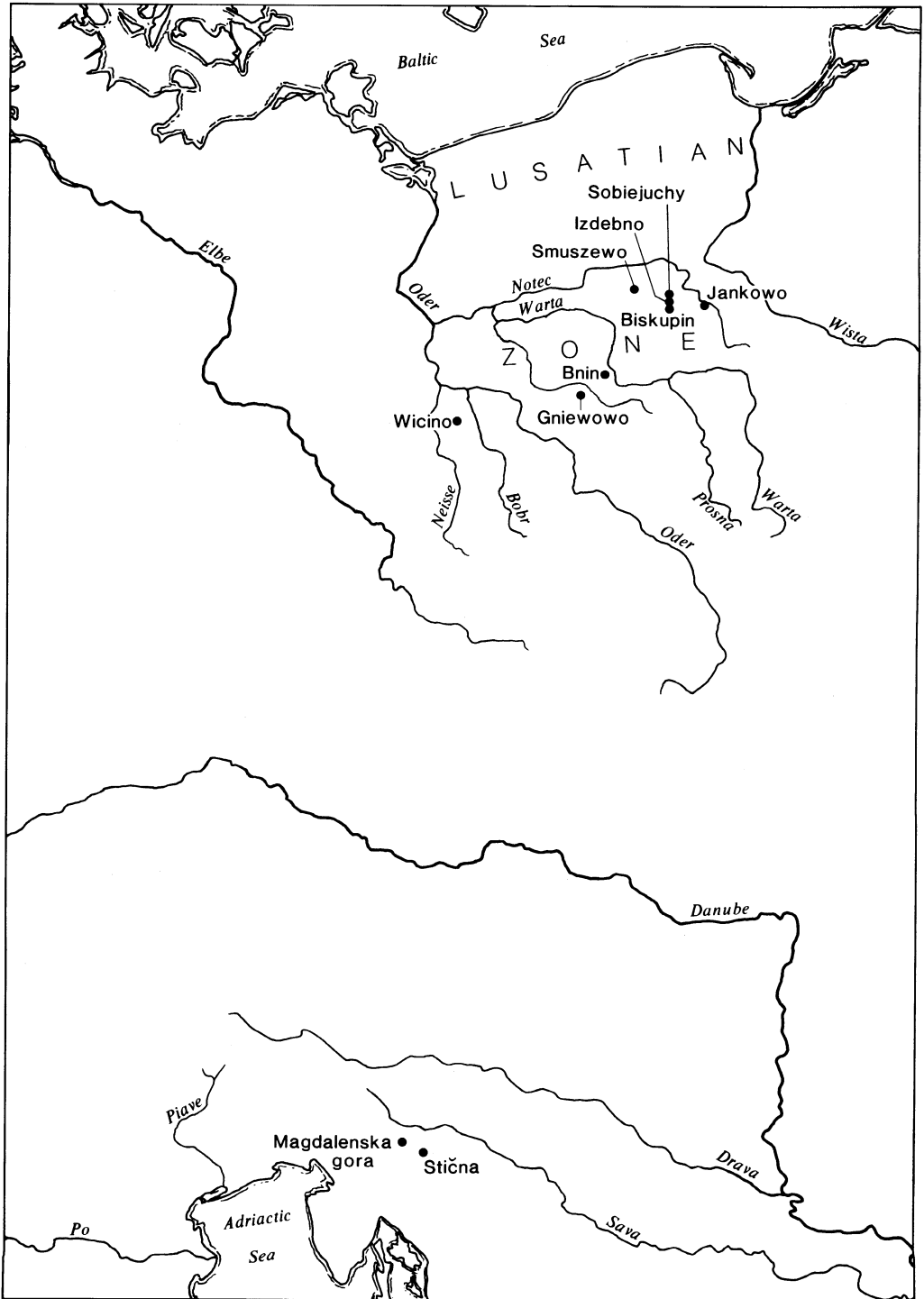
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east central europe



## DEMOGRAPHIC AND ECONOMIC CHANGES IN THE HALLSTATT PERIOD OF THE LUSATIAN CULTURE

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### Introduction

Any attempt to account for the demographic and economic changes in the Hallstatt Period must prove to be a challenging task. The problem, after all, consists in explaining not only certain specific human activities, but also their ultimate ramifications. These two aspects hitherto have been dealt with independently. This situation prevails not just in the province of archaeology, but also in all of the historical sciences. Researchers trying to account for various human activities usually follow one of three models:

- 1) chronicling, that is, merely reporting a given sequence of events;
- 2) hermeneutic models, based on methods that attempt to "understand" human actions from a psychological point of view; or
- 3) social scientific interpretation that aims at uncovering the motives of human actions, and is based on knowledge of conditions and "norms", that is, definite sets of values.

The social approach is nowadays considered to be the most creative way of explaining historical events, as it adopts a model of human beings acting consciously and purposefully. In central European archaeology, the use of this model is still being discussed. It remains debatable whether one should limit oneself to the superficial reconstruction of prehistory, or whether one should also consider the theoretical part of the narration that ultimately determines the credibility of the reconstructed historical phenomena.

This dilemma, in my opinion, has caused the artificial partition of archaeology into the "traditional"--based on facts--and the "new"--global and explanatory. This differentiation appears even more unnatural when we realize that the "traditional archaeology" preferred in central Europe has never been homogeneous, while the so-called "new archaeology" is still undergoing far-reaching changes. Therefore, we do not expect these distinctions to have any meaning for our investigations, and any

discussion about which of these conceptions is more helpful in reconstructing history would seem to be a purely academic argument.

Any successful results in the process of explaining historical events can only be reached through combining the experiences we have acquired hitherto in the area of empirical science with the possibilities that emerge from the humanistic and anthropological sciences, both at present and in the future. We must remember, however, that it is the theoretical conception, developed within the "new" archaeology, which determines the reality of the historical facts that we wish to reconstruct. provided that these reconstructions are both realistic and dynamic enough, and, in relation to the described facts, as isomorphic as possible.

Therefore, one should seek to convince those who believe in the "traditional" archaeology that the actual aim of any archaeological research, in the modern sense of the word, is not only the description of historical events, but also their global explanation. At the present stage of development of the historical disciplines it is necessary to have deep theoretical knowledge--to take into consideration so-called theoretical systems. On the basis of the available empirical data and the methodological premises presented above, I have made an attempt at explaining both the reasons and the results of demographic and economic changes that took place in the Hallstatt Period in the vast areas of the so-called Lusatian Culture.

An attempt to define "the rhythm, dynamics and stagnation" occurring in all economic processes is both tempting and unrewarding. Tempting, as it gives us a chance to reinterpret the already examined "basic set of facts", but unrewarding since such a reinterpretation may prove relatively unprolific or even too difficult, particularly when the period of time in question is rather long, as in this case of the entire first millennium B.C.

In order to understand fully the causes of change in the Hallstatt Period, we must first consider the changes from a considerably wider perspective. As is known on the basis of previous research, the old economic and social structures, dating back to the Bronze Age, underwent numerous changes in the first millennium B.C., turning into new systems largely under the influence of more highly developed centers of civilization in southern Europe. It is also known that those changes were accompanied, in some regions, by a serious demographic crisis. Naturally, all of these changes manifested themselves in different ways in different regions, according to their environment, respective stage of cultural development, and distance to the contemporary centers of civilization. In sum, the variation in these changes is due to the different historical backgrounds of the societies in these regions.

The point of our special interest is the situation that emerged in the areas of the Lusatian Culture in the peak phase of its development, that is, in the Hallstatt Period. Before I present the results of my research into the reasons and results of the demographic and economic changes, I would like to outline the general political situation that prevailed in the Hallstatt Period in the zone of the Oder and Vistula river basins. Since I do not wish to enter into a detailed analysis of the widely discussed extraneous causes of the collapse of Lusatian Culture, I shall limit myself to a brief outline of the so-called "political" events. I shall then describe a little more closely the internal factors that, in my opinion, caused the economic crisis in this society and, consequently, considerably weakened its demographic potential.

## Political Background

During HaA-HaB, many settlements were established in Silesia and in the central part of Poland, and their stability seems to be confirmed by the existence of regional groups and subgroups, by long-lasting colonies, and by long-used burial grounds, located at large settlements.

At the end of HaB, many pre-Scythian elements occurred in this area, only partly influenced by the Cimmerians. During that period the peoples living north of the Carpathian and Sudeten Mountains remained very dependent on the productive and cultural circle south of the Carpathians, with which they maintained strong connections. The Lusatian settlement zone, apart from its increasing internal stability, also tended to extend its range. A partition of the Lusatian Culture, which had appeared earlier, became more pronounced under the strong influence of the East Hallstatt cultural and productive center in the eastern Alpine region, and the so-called amber route.

The eastern zone of the Lusatian Culture remained under the influence of the Carpathian center, while the western zone was strongly influenced by the pre-Celtic (Bylanska or Horakowska) and northern Illyrian (Calondenberian) cultures. In HaD<sub>2</sub>, ca. 520-500 B.C., this latter area was the site of an armed incursion of Scythian groups coming from the east through the Karpacka Valley. The most characteristic features of the western zone include its own varieties of more general Hallstatt traits, such as fortified settlements (which date from HaA in the Lusatian Culture), production of iron (done domestically since HaD), and decorated pottery. This zone experienced considerable progress in politics, economy, and culture, including art style and religious beliefs. The Lusatian Culture was connected with the Hallstatt center by the far-reaching influence of the amber route whose ends lay in northern Italy, the east Alpine region, and the middle Danubian zone.

Toward the end of HaD, the settlements along the Oder river started to decline, both with respect to culture and organization, and, from LTA onward so did those settlements in the central part of Poland, eastern Great-Poland, and the Kujawy region. This decline was caused by, among other factors, the waning importance of the amber route along the Oder river. At the same time, the amber route along the Laba river became increasingly significant, and considerably modified the directions of many trade connections with the south. In this phase there emerged new connections with northern Yugoslavia and the northern Thracian zone, although there is no evidence of actual foreign infiltration.

The eastern zone of the Tarnobrzaska and Wysocka colonies, that had previously remained under the widespread influence of the Karpacka Valley, both with regard to culture and social organization, during HaC-LTA came to be strongly influenced by the so-called Scythian groups from Wolyn and Podole.

## Anthropogenic Changes in the Natural Environment

Among the most essential internal factors that determined the rapidity of the demographic and economic changes were alterations in the natural environment, caused both by a deterioration of the climate and the economic activities of the human populations.

Although I recognize that one of the causes of the demographic and economic changes in the Hallstatt Period in the Oder and Vistula Basins was the changing of the natural background, I do not ascribe to that

factor the same role as I do to the activities of human beings. Nature was merely one of the factors determining human activity. In other words, nature created numerous possibilities which could then be transformed into a favorable situation by human beings. When the previous conditions of human activity changed considerably, nature merely constituted one of the basic elements of the new conditions. Therefore, for the sake of brevity, I use the term "anthropogenic cause."

As we know, in the Hallstatt Period central Europe was under the influence of two different types of climate: Sub-Boreal (its late phase) and Sub-Atlantic (its early phase). The transition between these two climates is believed to have taken place at the turn of the seventh and sixth centuries B.C. We can generally say that the climate prevailing in the Bronze Age was hot and humid at the beginning, gradually becoming drier. Because of the dry Sub-Boreal phase with its lower rainfall, the level of groundwater sank considerably in many parts of Europe, which, consequently, decreased the vast areas formerly covered by marshes and peat bogs. Some areas previously covered by woods turned into fields of grass or even, in their turn, other peat bogs. The terrains of leafy and mixed forests generally increased.

The next climatic change took place in the transition between the Sub-Boreal and Sub-Atlantic periods. This shift resulted not only in increased rainfall, but also in a drop in the average annual temperature. The best illustration of these climatic changes is undoubtedly seen in pollen samples coming from various parts of Europe (e.g. Iversen 1969; Berglund 1969, 1985; Ložek 1980; Huntley & Birks 1983). The oak forests became less numerous in this period, giving way to mixed forests of beech, hornbeam, spruce and fir.

Apart from the purely climatic changes, the natural environment of the Hallstatt populations was also altered by their own economic activity. We can assume that there occurred certain marked anthropogenic changes in the natural environment at the end of the Bronze Age, and particularly during the transition from Bronze Age to Iron Age during the Hallstatt Period. Those changes were most radical in the composition of the flora of particularly densely populated microregions. Some kinds of trees were totally devastated, and the wooded areas never regained their former condition.

Oak forests, along with elms and lime-trees seem to have been especially affected by human economic intervention. They were, in upland regions, replaced by hornbeam, which previously had occurred only very rarely in the lower zones of central Europe. The influence which particularly dense populations exert on their natural environment exhibited itself as a permanent, wasteful exploitation in these regions (e.g. Biskupin, Bnin, Izdebno, Jankowo, Smuszewo, Sobiejuchy). Along with the climatic changes that took place at the transition between the Sub-Boreal and Sub-Atlantic periods, this exploitation is readily seen in the pollen diagrams from the different zones of central Europe.

All the relations that exist between a human being and its natural environment have an element of feedback: the living population, by exploiting the natural resources of their environment, change the conditions of existence, both for themselves and their successors. Therefore, the anthropogenic changes in various microregions affected the economic activity of the living populations in both positive and negative ways. These changes were not always constant and long-standing; in fact, as a rule they occurred irregularly, following each other in disorderly succession. In some instances, such as the Hallstatt Period, however, the

intensification of economic activity coincided with unfavorable climatic changes, which magnified the effect of the anthropogenic changes and expanded their range. We may assume, then, that all the environmental changes--those caused by living populations and those resulting from natural climatic transformations--were markedly reflected in the rate and direction of demographic and economic developments, particularly in densely settled microregions.

### Changes in the Demographic Structure

Before I present the preliminary and, undoubtedly, highly debatable data concerning the demographic changes of the Hallstatt Period, I shall briefly outline the basic assumptions that underlie my research. In my ecological approach to the economy of prehistoric populations, I put special emphasis on rough estimates of the number of people in a given microregion engaged in economic activities. However, the way in which living populations function depends not only on the number of individuals, but also on the sex and age structure, and the biological dynamics, reflected in the birth and death rates. These statistics are, as we know, the object of interest of "paleodemography", the discipline concerned with the demographic characteristics of prehistoric populations. Being a part of demography, paleodemography examines those variables that can be expressed quantitatively and, later, defines the factors that govern those variables. Therefore, the importance of paleodemography is today becoming increasingly appreciated, and the archaeological literature has recently been enriched with several handbooks concerning the application of demographic methods to archaeology (e.g. Welinder 1977; Hassan 1981; Neustupný 1983). I shall not repeat here, then, what has already been defined, but I will point out some problems that accompany the investigation of demographic changes in the Hallstatt Period.

What seem to be particularly difficult to define, considering the character of the materials that we have at our disposal, are the biological dynamics of the populations. In order to determine the values of the variables in respective densely inhabited microregions, it is necessary to have the following data: the number of births during a given period of time, the number of deaths during that period, the number of people living in the given period, and the number of immigrants and emigrants during that period. The difference between the former two quantities reveals the natural increase (or decrease) in the population, the difference between the latter two quantities yields the migration balance. By adding up these two differences, we learn the actual growth of the population, expressed in the absolute numbers that are most useful for our research. It must be stressed here, however, that both migration balance and natural "increase" can be positive or negative. In reality, we hardly ever know these numbers in paleodemography.

From previous research on the Hallstatt Period we can only gather some data about mortality, which can be expressed only in indeterminate numbers. On the basis of the fertility diagram we also have some picture of the birth-rate, albeit not a very accurate one. Therefore, my attempts to define the size of the populations in the Biskupin-type strongholds of the Hallstatt Period Lusatian Culture are based on the assumption that the size of the population that could theoretically inhabit a given micro-region is directly related to the amount of natural resources in this zone, measured in units of energy (Henneberg & Ostojka-Zagórski 1984). This measure, generally known as the "population density", is, despite its inaccuracy, very useful in research on changes in economic structure in small areas.



The necessity of regular cooperation among members of a group was, in the Hallstatt Period, the major cause of the uneven distribution of the groups in particular regions. There was a tendency to locate the settlements in different parts of an accessible area determined by the local environmental conditions. This tendency meant that the concentration and stability of the group was determined by the ecological resources of the given zone. We should remember, however, that the main factor determining the intensity of settlement was the way in which particular human populations exploited these natural resources. Therefore, in various zones equally abundant with natural resources, the populations might have been larger or smaller, depending on their approach to the environment which they exploited, the internal structure of the group, and their relations with other groups--in other words, their cultural situation. The social and cultural relations were quite important, since they could efficiently prevent populations from over-exploiting the environment, and could maintain populations at optimal levels.

Considering the above limitations, on the basis of the analysis of the size and structure of the Biskupin-type settlements, as well as other "open" sites connected to these larger settlements, I have assumed populations of about 1000 individuals for the Hallstatt Period in the regions of Biskupin, Izdebno, Jankowo, Sobiejuchy and Smuszewo. The average distances between intensely inhabited centers, which the Biskupin-type strongholds undoubtedly were, allows us to assume that particular groups had at their disposal an area with a radius of about 10 km, or 314 km<sup>2</sup>. We can gather, therefore, that the density of the populations amounted to about three individuals per km<sup>2</sup>, with the understanding, naturally, that the spatial distribution of the population was uneven.

Since the sex ratio typical of the human species today, about 1:1, is usually found in prehistoric burial grounds, we can assume that it was also characteristic of the Hallstatt populations. Table 1 illustrates two possible variations of the age structure, reconstructed by Acsádi & Nemeskéri (1970) on the basis of mortality tables.

**Table 1.** Two possible population age structures, reconstructed on the basis of mortality tables from Acsádi & Nemeskéri (1970). Originally from Henneberg & Ostoj-Zagórski (1984:55, Figure 1).

<u>Age/Years</u>	<u>Number of individuals</u>	
	<u>A</u>	<u>B</u>
0 - 1	41.8	31.3
1 - 3	90.4	77.3
4 - 6	76.0	71.8
7 - 9	70.9	68.8
10-12	68.2	66.1
13-15	66.0	63.7
16-19	84.8	80.9
20-49	413.3	444.2
50-xx	88.9	95.9
Total	999.9	1000.0

In both versions, despite a few quantitative differences, the general picture is quite similar: over 10% of the population consists of infants and children requiring intense care; about 40% are older children and adolescents; about 40% are fully productive and biologically reproductive adults; and about 10% are senile adults.

Let us now compare the results of the theoretical demographic reconstruction estimated from the data from the Hallstatt burial grounds in the basins of the Oder and Vistula rivers (see Table 2). The data obtained from three cemeteries, Sobiejuchy, Wicino, and Gniewowo, enable us to determine the number of people who were simultaneously engaged in the exploitation of those areas. In order to accomplish this, the methods of Gejvall were used, assuming that the size of the populations using these cemeteries remained unchanged over their period of use (cf. Acsády & Nemeskéry 1970).

Thus we obtain the following numbers. We can ultimately assume that the group burying their dead in Sobiejuchy consisted of about 300-350 individuals, although it remains an open question as to whether the cemetery was used for the full 75-100 years as has been assumed, or was used by a larger group of people within a shorter period of time. The excavations in the Sobiejuchy microregions are still in progress, and the data obtained so far suggest that the number of dead buried in the Sobiejuchy cemetery represent about 1/3 of the total population of the settlement.

The size of the group using the Wicino cemetery, connected to another stronghold, located in the western part of the Oder/Vistula basin system, was computed on the basis of the following parameters: the duration of the cemetery--about 200 years; and the number of dead--990. The number of dead does not correspond to the total number of graves discovered in the cemetery (502), since many of the graves contained the remains of more than one individual (15% of the graves). If they were double burials, they would represent an additional 75 individuals, since about 100 graves remain unexcavated. There is also a difference between the theoretically expected number of deaths in the age range 0-15 years, and that actually discovered (313).

It was determined, on the bases of these data, that the group using the Wicino cemetery consisted of about 100 people. This result allows us to propose the hypothesis that there must have existed more than one

**Table 2.** A comparison of the demographic analyses of Hallstatt groups of the Lusatian culture from the Oder and Vistula basins. Key: N is the number of individuals;  $e_0$  is the life expectancy at birth;  $I_{bs}$  is the reproductive possibility of an average individual ( $e'_0$  and  $I'_{bs}$  are these respective values when dead infants are not taken into account);  $R_{pot}$  is the potential reproductive rate;  $l_{20}$  is the percentage of individuals reaching age 20; and  $DR^x$  is the dependancy ratio, the number of individuals who require constant care out of all individuals at reproductive age (see Henneberg & Kihl-Szymańska 1980:116, Figure 4).

Group	N	e	$e'_0$	$I_{bs}$	$I'_{bs}$	$R_{pot}$	$e_{20}$	$l_{20}$	$DR^x$
1. Sobiejuchy	745	26.5	17.0	0.53	0.28	0.72	14.7	0.38	2.2
2. Wicino	465	26.5	17.5	0.43	0.29	0.71	19.5	0.38	1.5
3. Gniewowo	185	29.8	20.0	0.51	0.33	0.69	18.7	0.47	1.5

cemetery in the Wicino microregion, since the sample size from the excavated one corresponds neither to the size of the stronghold, nor to what other data tell us about the intensity of settlement in the region.

We have also obtained certain demographic data from the Gniewowo cemetery in the western part of Great-Poland. On the assumption that this cemetery was used regularly throughout the Hallstatt Period, a span of 300 years, along with the data that there are 1266 individuals represented in the cemetery and that the life expectancy at birth ( $e_0$ ) was 25 years, we arrive at a total of 106 individuals living simultaneously.

The above data enable us to determine that the Hallstatt groups of the Lusatian Culture, economically independent and with a definite area at their disposal, consisted on the average of 100-350 individuals. In certain regions, however, particularly where the Biskupin-type strongholds were prevailing, those numbers must have been three times as large. Such highly developed settlements could function properly only if they had reached a relatively advanced level of internal structure and organization. Obtaining such a level would be possible only in sufficiently large groups. The concentration of people in the fortified settlements of this type and the intensification of resource exploitation in the vicinities of these strongholds prove that the human groups must have been considerably larger than those inhabiting settlements of other types. They were also definitely larger than the groups in the Hallstatt Period inhabiting the east Alpine zone of Europe (see, e.g., Wells 1981:97-101).

It is necessary that, while trying to estimate the nature and extent of the economic changes in the Hallstatt Period, we consider the actual size of the populations within the zones where direct economic activity of any form was taking place, so that meaningful population densities can be determined. Such attempts can only be made for microregions that are, in the archaeological sense, well-studied. With this in mind, I have investigated the region of Pomerania (Ostoja-Zagórski 1982:130-133) and the microregions of Jankowo (Ostoja-Zagórski 1978) and Sobiejuchy (Harding & Ostoja-Zagórski 1978). On the basis of these studies, I have determined that the density of population in the Biskupin-type settlements was on the average 16-17 individuals per km<sup>2</sup> in the total area exploited economically, and about 62-63 individuals per km<sup>2</sup> for the area subject to cultivation. In the region of Pomerania these ratios were, respectively, 12.1 and 60.2 (Ostoja-Zagórski 1980:146). The great concentration of people in the areas of cultivation is probably due to the fact that the prehistoric farmers tried to minimize the distance between their settlements and their fields, in order to save time and energy. This distance may, to a high degree, determine the efficiency of cultivation (Higgs & Vita-Finzi 1972:29, Fig. 3).

Naturally, all of the demographic data presented here are hypothetical, and possibly inaccurate. Nonetheless, they enrich the discussion of economic change in the Hallstatt period by supplying purely quantitative criteria which ultimately allow us to consider the problem of the economic changes from a direction which was previously inaccessible.

## Economic Changes

In this section I shall limit myself only to the most general conclusions, owing to the fact that, despite the remarkable progress that recently has been made in archaeological research of this kind, the picture which we have obtained for the economic changes in the Hallstatt period still remains somewhat unclear. The most recent excavations undertaken in various parts of central Europe, concerned as they are with

the so-called material culture, supply us with relatively detailed information about the qualitative structure of the Hallstatt economy. Nevertheless, such information also proves invaluable in any attempt to determine the quantitative nature of economic relationships, and it is toward the quantitative analysis of the economic phenomena that we should turn our attention.

In order to estimate the extent of the structural changes that occurred during the Hallstatt Period, we must take into account three different kinds of data: those generated by paleobotanical studies; those based on paleozoological studies; and those concerned with geomorphology, that is, with showing the relationship between particular archaeological finds and the physiographic elements of the local environment, such as terrain, hydrologic conditions, and soil type. We already have accumulated a sufficient number of observations concerning these categories to enable certain quantitative comparisons. It must be stressed, however, that the terrains in which Lusatian Culture flourished have been only roughly examined so far, and, as a result, we can only consider in our remarks a few selected microregions that have been thoroughly examined and well-described.

As has been mentioned above, the first type of data concerns botanical observations. Such data can be obtained both from pollen diagrams and from botanical finds, such as seeds or other remains of cultigens, from different sites of the Hallstatt Period.

We may assume, on the basis of the latest palynological research (e.g. Ostoja-Zagórski 1982:49, Fig. 1; Jankowska 1980; Latałowa 1985; Szafrński 1973; Tobolski 1982), that in the Hallstatt Period the intensive exploitation and, consequently, the rotation of inhabited zones brought about widespread devastation of the environment. At the same time, the extent of arable terrain increased notably. The pollen diagrams show that the curve for crop pollen, rather low in earlier periods, increases towards the end of the Bronze Age, which is undoubtedly evidence for developing land cultivation. The curve for *Plantago lanceolata* pollen, on the other hand, decreases considerably, indicating a shrinkage of pasture.

As for the crop remains of the Hallstatt Period, the pollen data indicate that the use of common barley and wheat became increasingly dominant (Klichowski 1984:77, Fig. 5). The occurrence of rye (*Secale cereale*) also increased. This fact may serve as an indicator of certain improvements in plow technology (Dymaczewski 1968:305; Godłowski 1966:86). The rye pollen occurs particularly in the Hallstatt Period (Ralska-Jasiewiczowa 1981:39-40). We may assume, however, that the occurrence of rye is strongly correlated with the intensification of barley cultivation. As palynological research has shown, in the early part of the first millennium B.C. in Germany and Scandinavia, rye occurred as a weed in fields of barley (Helbaek 1971; Lange 1976:98). It was only cultivated for itself on a large scale towards the end of the first millennium in the Roman provinces along the Rhine and Danube rivers, in England after the Roman invasion, and in Poland (Hicks 1971; Kurnatowski 1981:81, Fig. 11). Rye did not play an important role in Hallstatt agriculture in the areas of the Lusatian Culture. The available remains of grain enable us to form an additional hypothesis, that from the Hallstatt Period onwards the tendencies in cultivation continued to change considerably. The hypothesis about monoculture among various groups of the Lusatian culture appear, however rather unconvincing (Jockenhövel & Ostoja-Zagórski in press).

Other essential indicators of structural changes in the Hallstatt economy of central Europe are provided by paleozoological research.

Towards the end of the Bronze Age, particularly in the Hallstatt Period, a gradual but steady decrease in the number of domestic cattle can be discerned. From the Hallstatt Period onwards, especially in lowland areas, the most common species were pig, sheep and goat. The bone remains from the Bnin microregion near Srem seem convincing proof of this hypothesis (Sobociński 1975). From the very beginning of the Hallstatt Period cattle breeding decreased noticeably, by about 11.2%, whereas the number of pigs grew by about 7.8%. The process of eliminating cattle from the practice of animal husbandry continued into the La Tène Period (Ostoja-Zagórski 1974:127, Fig. 2).

These tendencies are of great interest to central European archaeology. The very fact of changes between the proportions of particular kinds of animal bones is quite significant. Although the available data do not differ greatly from those indicating the situation prevailing towards the end of the Bronze Age, for the Hallstatt Period we have the impression that the concentrations of people within relatively small zones of resource exploitation made it necessary to seek the most profitable forms of animal husbandry. Achieving a positive result in this respect was performed most easily by preferring species with shorter productive cycles, namely goat, pig, or sheep.

Important supplements to this kind of research are analyses that show the location of archaeological sites in relation to the physiographic elements of the local environment. In the Hallstatt Period, human populations preferred basically the same areas as did the populations of the Stone and Bronze Ages. One of the main differences was that the intensive economic exploitation of the areas around the large Hallstatt population centers, the Biskupin-type settlements, brought about considerable devastation of nearby wooded areas. In the later phases of the Hallstatt Period, settlement occurred mainly in the wider tunnel-valleys and post-glacial slopes along rivers and around lakes. In some very intensely settled microregions, human groups concentrated on the very bottoms of tunnel-valleys, and the climate seems to have been particularly conducive to this process.

The tendency to move the higher situated settlements to the lowland areas arose out of certain economic necessities: the lowland terrains were usually the richest, with the most fertile soil, and therefore most useful for cultivation. We must keep in mind that crop production was rather low and, most probably, hardly ever reached 200 kg/ha. Greater harvests could only be obtained through the slash-and-burn technique. However, considering the limited sizes of the areas under cultivation, slash-and-burn agriculture would have been impractical and, if applied for too long a time, would have inevitably have led to a drastic decrease in the harvest.

Yearly cultivation of 0.5 ha, with a three year rotation cycle, would have required an additional 15 ha of wooded area. The density of human population in this kind of economy could not have exceeded 4-5 individuals per km<sup>2</sup> (Lowmianski 1972:530). As we remember from the earlier calculations, the number of people per km<sup>2</sup> in the economically exploited areas of the intensely settled Hallstatt microregions was over 60! Therefore, in the Hallstatt Period the arable regions around the Biskupin-type settlements could not supply enough food for the local populations. The question is, then, what other forms of economy could have fulfilled the nutritional needs of the human populations during their 100 years of stability.

As the research on the Biskupin-type settlements shows (Ostoja-Zagórski 1983), the nutritional economy which prevailed in the Hallstatt Period was "multidirectional." It consisted of simultaneously using all of the various possibilities presented by the natural environment, thereby

improving the efficiency of resource exploitation without serious damage to the ecological balance. The arable areas available to the Biskupin-type settlements were rather small. Consequently, their inhabitants had to prefer those plants, available within contemporary agrotechnical possibilities, which produced maximum yields per unit area, and whose roots and rhizomes were particularly nutritious (e.g. legumes).

Leguminous plants possess three special qualities. First of all, they have high caloric value. For example, 100g of dried peas, which is 24.5% protein and 50% sugar and starch, provides 298 Calories. The same values for other crops are decidedly lower. The second quality, which is quite important in light of the climatic conditions of the Hallstatt Period, is the resistance, especially among the peas and broad beans, to drops in temperature. The third essential characteristic of legumes, which must have been appreciated by the Hallstatt populations, is their ability to live in symbiosis with bacteria that absorb nitrogen. On the average, legumes absorb from 100 to 200 kg of pure nitrogen per ha (Nowiński 1970:212), which is an essential factor in determining the fertility of the soil.

The harvesters of ancient Rome were already well aware of these properties (ibid:213), and we may guess that they were also appreciated by the Hallstatt populations. The important role of leguminous plants in the Hallstatt economy of the Oder and Vistula basins is confirmed empirically by numerous remains recovered from cultural layers of different sites (Klichowska 1984:81-85). Undoubtedly, within particular settlement regions the best areas for the cultivation of vegetables and legumes were those where cyclical inundation took place; where the soil was regenerated by winter and spring floods. Excessive humidity could be controlled in those places by digging and forming mounds. Such mounds are found at most of the settlements, both seasonal and year-round sites, and were usually located at the edges of the annually inundated terraces, particularly in the places where the terraces were the widest and, through a mild slope, connected with terraces located on higher ground.

On the basis of the available data, we may assume that the Lusatian people in the Hallstatt Period adhered to three main agrotechniques. In the lowland areas, where vegetable gardens prevailed, the most popular agrotechnique must have been hoe horticulture. Primitive plowing prevailed in the fields of the second zone adjoining the settlements. It must be mentioned here that the prevalence of ploughing tools towards the end of the Bronze Age does not, as it is sometimes believed, indicate the elimination of conventional agrotechniques such as digging (Ennen & Janssen 1979:47-49), but contributed to their improvement and enrichment with new varieties. The primitive pictures engraved on the rocks in Val Camonica prove clearly that both techniques, digging and plowing, supplemented each other in the process of soil cultivation (Anati 1960:125; Fig. 39). However, two ploughs found in Biskupin (Godzowski 1960:40) and another two found from Popowo and Wiewiórki in the Duchy of Toruń seem to indicate that the ploughing technique was used by the Hallstatt communities on a larger scale.

Apart from what we know about gardens and fields adjacent to the sites in the annually inundated areas, we also have some picture of the more remote fields. From various ethnographic analogies we gather that such areas were usually cultivated extensively and, at the same time, rather carelessly. We may guess, then, that in distant areas the Hallstatt societies applied the most primitive shifting cultivation, using the slash-and-burn technique. The fact that charcoal, registered in macroscopic specimens, occurs in nearly all the dust spectra of the palynological diagrams seems to confirm the above hypothesis. In these upland

zones, because of geomorphological conditions, the soil could only be cultivated manually. It is a point of interest, then, to determine what types of grain could be sown in such regions. It would seem that it was mainly common barley and possibly rye, although, as mentioned above, I maintain that in the Hallstatt Period the latter occurred mainly as a weed in the barley fields.

On the basis of the above remarks on the economy of the Lusatian areas in the Hallstatt Period we may formulate the following conclusions: The Hallstatt economy reached the climax of its development in the Bronze Age as a result of a slow process, but one that lasted a couple of thousand years. This process of adopting new methods of soil cultivation was first introduced by immigrants from the south of Europe, and was characterized by the following qualities (Barker 1985):

- 1) "multidirectional" orientation both with regard to the exploitation of different zones of the natural environment and different techniques of soil cultivation--both intensive, requiring a great deal of labor, and extensive. Most commonly agriculture was intensive, and involved permanent horticulture along with shifting cultivation with alternate periods of crop and fallow in more remote areas. In densely populated terrains, such as the areas of the Biskupin-type settlements, intensive horticulture definitely predominated.

- 2) Another basic quality of the Hallstatt economy was flexibility; that is the ability to adjust to varying conditions and, consequently, to develop such techniques as proven to be the most efficient and reliable in new ecological situations.

All of the techniques of environmental exploitation mentioned above required, naturally, a lot of time and energy, both in agriculture and animal husbandry. However, the lack of handy tools during the Hallstatt Period considerably lessened the efficiency of the work (Ostoja-Zagórski 1982:159-167). Therefore, we may assume that the most prosperous economy was possible only in groups with a relatively high level of internal organization. In the earlier phases of the Hallstatt Period an interesting phenomenon occurred: a gradual chain of events in the areas of the Lusatian Culture resulted in considerable economic changes pregnant with consequences.

As I have already mentioned, the border between the Sub-Boreal and Sub-Atlantic periods was characterized by certain climatic changes (Harding 1982) which resulted in an increase in precipitation and, consequently, a clearly visible rise in the levels of rivers, lakes, and underground waters (Dzięczkowski & Ostoja-Zagórski 1976; Nowaczyk et al. 1981). The transgression of the water, whose traces have been registered on the basis of sedimentological, archaeological, malacological, palynological and paleohydrological research, brought about considerable and, from the point of view of the contemporary economy, essential changes: not only were the settlements of the Lusatian culture inundated, but so were about 50% of the areas formerly cultivated in the northeast part of Great-Poland.

Naturally, the lowland areas adjacent to lakes and rivers, previously subject to annual inundation, were the first to be eliminated by the rising water. Thus, human groups inhabiting particular strongholds could no longer obtain sufficient amounts of food, food that to that point had been provided by the efficient harvesting of vegetables and legumes. Furthermore, the narrow choice of economically efficient tools and, consequently, the lack of the possibility of applying any satisfactory means

of production, made cultivation of upland areas very difficult. The higher areas, subject to grain cultivation, were decidedly less efficient than the arable zones exploited earlier.

Human groups inhabiting particular microregions were no longer able to satisfy their material and energetic needs. Even attempts at intensifying subsistence activity did not prevent the crisis, neither through intensification of animal husbandry nor through any other form of obtaining food such as hunting, fishing, or gathering mushrooms and berries. On the other hand, this actually wasteful exploitation caused severe ecological damage, which caused the biological conditions of the particular populations to further deteriorate. The results of the economic disturbances can be seen in the life tables calculated for the last phase of the utilization of the Sobiejuchy cemetery (Ostoja-Zagórski & Strzałko 1984:44).

We may assume, then, that the former prosperity of the Biskupin-type communities which manifested itself mainly through the highly organized internal structure of the groups and a well-developed cultural and social life, was rather violently destroyed. Abandonment of the settlements and destruction of the existing social and territorial structures were, undoubtedly, an attempt at breaking out of the crisis. We may guess that the dispersion of the settlements into small groups and the destruction of the old organizational structures stimulated the development of more extensive agrotechniques, for example the wide-spread use of shifting cultivation.

### Concluding Remarks

In order to complete the discussion of the demographic and economic changes that took place in the Hallstatt Period in the vast areas of the Lusatian Culture, it is advantageous to sum up some of the general conclusions presented so far.

In the zone of central Europe considered here, the main achievements of the Bronze Age civilization are particularly noteworthy. The rapid progress of the Lusatian Culture was synchronized, on the one hand, with deep changes in the process of settlement including in certain regions the building of new strongholds, and, on the other hand, with considerable demographic increases that in many cases resulted from the rapid economic progress. The concentration of human communities in fortified settlements and their vicinities was accompanied by the climatic changes that occurred at the transition between the Sub-Boreal and Sub-Atlantic periods. These changes led to the elimination of over 50% of all arable areas. Intensification of the economic activity in the remaining areas resulted in rapid ecological devastation of certain particularly intensely settled microregions.

Toward the end of the Bronze Age it became necessary to seek new, more suitable settlement conditions. The resulting migration to previously uninhabited areas was evidently accompanied by numerous changes in the old organizational structures. Consequently, the number of fortified settlements decreased dramatically as they dispersed into many small groups, unevenly distributed throughout the countryside. The size of the human groups cooperating economically became smaller and smaller. At this time certain cultural changes also took place in the area of the Oder and Vistula basins. The Lusatian Culture started to decline, whereas the subregions of Eastern Pomerania (and later also other areas of the Oder and Vistula basins) were influenced by the developing Pomeranian Culture.



These cultural changes undoubtedly resulted from the earlier changes in the economic demographic and, most importantly social structures. On no account can these changes be considered progressive. They were merely a sign of an arising economic crisis which, by the middle phase of the La Tène Period, gripped nearly the whole area of the Lusatian Culture. This crisis was particularly acute in the third century B.C. and did not abate until much later. That it ended was mainly due to numerous innovations in agriculture, such as the iron hoe. The introduction of iron in general considerably improved the efficiency of the Hallstatt economy; still, it did not cause its wholesale reorganization which took place only in the Early Middle Ages, with the full integration of the possibilities allowed by iron into agriculture as such, and the production of tools (Lowmianski 1972:531). These irregularly occurring changes have even been referred to as an "agricultural revolution" (Kurnatowski 1979:158).

Can we, then, consider the economic changes of the Hallstatt Period to have been positive, or must we rather regard them as having had a destructive influence? To answer a question formulated in this manner is too difficult given the current state of archaeological research. What can be stated without doubt is that all of the economic changes, visible in the archaeological, paleobotanical, palynological and paleozoological material were attempts to adjust the economy of the Bronze Age to the new settlement situation that arose along with the highly organized Biskupin-type settlements. These attempts failed most probably because the new type of settlements required highly integrated internal structures, which constituted a weak link in the Lusatian cultural system. The temporary loss of ecological stability led to a decline old traditions such as the building of strongholds. We must remember, however, that at approximately the same time the decline of strongholds took place in other parts of Europe as well, notably in the Celtic areas such as the central, upland part of southern Germany and certain areas in France.

A question arises, then, as to what was the cause of this phenomenon which manifested itself so widely within so short a period of time. We may guess that basically it was the demographic and economic crisis, which is detectable in European archaeological material. The symptoms of this crisis appeared relatively early, already by the Hallstatt Period in the Oder and Vistula basins, the vast area of the Lusatian Culture.

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## TECHNOLOGY AND SOCIAL CHANGE:

### IRONWORKING IN THE RISE OF SOCIAL COMPLEXITY IN IRON AGE CENTRAL EUROPE

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#### Introduction

It has long been recognized that the last millennium B.C. was a time of profound social change in central Europe (see Bintliff 1984a; Wells 1984 for recent discussions that include historical backgrounds). It was also the period of the gradual but steady spread of ironworking into central Europe and beyond into western and northern Europe, as well as of the gradual and steady improvement of ironworking technology. Scholars have long sought to link the social and technological developments.

Although correlations in the archaeological record do not necessarily signify causal links, in the case of iron metallurgy in prehistoric Europe the technological developments and the apparent social changes seem intuitively interrelated. Iron is the second most common metal in the earth's crust (after aluminum), and is particularly common in central Europe; much more so than copper or, especially, tin, the constituents of bronze. The adoption of ironworking therefore had the potential to transform radically a European society whose economy was based on bronze. Such a society existed in Bronze Age central Europe, where, although bronze was primarily a material of prestige and ideological value, trade routes were built to a considerable extent around the acquisition of copper and tin.

#### Technological Considerations

To understand the potential for social transformation, we need to look briefly at the properties of iron vis-à-vis bronze (for an extended discussion, see Wheeler & Maddin 1980). Iron in prehistoric central Europe was always produced by the bloomery process. The furnaces could not achieve the melting point of iron, so the metal was reduced from the ore in solid state. The unwanted material in the ore melted, and ran off as slag. The iron formed in place in a sponge-like mass, called a bloom, which still contained some slag interstitially. The bloom had to be consolidated by subsequent heating and reforging, and final objects had to be shaped in the same manner.

Wrought iron, as the product of the bloomery process was known, tends to be relatively pure, and therefore quite soft. The slag inclusions give some toughness, but basically iron is comparable in hardness to copper, and much inferior to bronze, a copper-tin mixture. All of these metals can be hardened by cold-working, but each is limited by its initial unworked hardness. As a metal is cold-worked it also becomes brittle, but extreme variations in shape can be achieved by annealing, reheating the cold-worked metal to below the melting point to allow the crystal structure to revert to normal without losing the macroscopic shape.

Such smithing is very labor intensive, and bronze tools and weapons were most efficiently produced by casting an object as close to the finished form as possible, and then touching up the shape and mechanical properties with cold-working. However, a range of aesthetic effects could be achieved by hammering and annealing bronze into thin sheets, which could then be shaped, welded, and manipulated in various ways. This procedure was not only quite labor intensive, but involved a good deal of specialized knowledge as well, and was certainly reserved for artifacts where appearance was important and socioeconomic investment was possible, such as objects for elite consumption.

The best way to harden iron is by the addition of other elements, a process called alloying. As referred to above, copper and tin can be mixed to form bronze. Controlling the ratio of copper to tin, as well as the concentrations of other constituents, such as lead, gave the bronzeworker some control over the mechanical and aesthetic properties of their material. It would have been difficult to alloy wrought iron with other metals, however, because it could not be melted. Such alloying may occur fortuitously due to the contents of ores, and ores presumably could have been selected that would have been more likely to give a positive result. Of course, the prehistoric metalworkers did not know the chemical basis of what they were doing, nor could they control it. Any such manipulation would have been empirical and chancy.

The addition of some non-metallic elements similarly hardens iron, although the resultant material is more brittle than wrought iron, especially at colder temperatures. Like some metallic elements, some phosphorus or nitrogen could have been introduced directly from ores. Carbon, which is readily available in nature in organic materials, is the most important element in this regard. The addition of even a small amount of carbon, carburization makes iron into the harder substance steel. This improvement accrues up to an optimum concentration of about 0.8% carbon by weight.

Not only is a good steel the equivalent mechanically of an optimally cold-worked bronze, but steels in excess of about 0.3% carbon can be further drastically hardened by heating and then rapidly cooling by quenching in a liquid such as water. Such quench-hardening does not work on pure iron or other metals. The quenched steel is very brittle, but reheating enables the brittleness to be reduced at the cost of some of the hardness. Thus, within certain constraints, the ironsmith has control over the balance between these two properties.

A bloom or parts thereof can sometimes become accidentally carburized during smelting, but this is usually quite inhomogeneous. There are three basic ways to intentionally carburize wrought iron. First, it can be left in the forge in the presence of carbon for a long period of time. The carbon, which usually takes the form of a wrapping or case of organic material, will slowly penetrate the iron from the outside. With this method a superior tool or weapon could be created that has a hard but brittle edge on a soft back that lends toughness. This so-called case-

hardening produces tools that are vastly mechanically superior to anything made of bronze, but it is a very time-consuming process.

A quicker, though not quite as mechanically sound technique of producing a tool that is still superior to bronze is to weld a steel edge directly to an iron back. The steel could be obtained from an accidentally carburized portion of a bloom, or by case-hardening a thin piece of iron, a process that greatly reduces the production time because carbon infiltrates the iron from both sides. This iron-to-steel welding is technically difficult, however, because the steel portion tends to become decarburized during forging.

Once case-hardening and iron-to-steel welding are mastered, excellent tools can be produced by forging together alternating thin layers of iron and steel, a process called piling. In summary, wrought ironworking employs a range of complex techniques that under optimal conditions enable the production of tools and weapons that are excellent mechanically. The raw materials of these techniques are iron ore and wood and other organic materials, all quite common in prehistoric central Europe.

Bronzeworking involves the ores of copper and tin, somewhat restricted resources, as well as wood, and has a more limited range of techniques, at least when it comes to affecting mechanical properties. Furthermore, the optimum production of a bronze tool involves the simple steps of casting and work-hardening the working edge. Basic bronzeworking requires, on the average, significantly rarer materials but less labor intensity and specialization than iron production, and the end product of the latter is potentially greatly superior.

## The Case Study

An understanding of the place of the development of ironworking technology in the social evolution of central Europe is of course a worthy goal in its own right. However, given the profound differences between the technical systems of bronze and iron, a case study of the transition from a bronze-based to an iron-based economy also has implications for broader theoretical issues that are currently under consideration in anthropology. The rapid and tumultuous expansion of the western capitalist world system since the industrial revolution has led many social scientists, including historians, anthropologists and sociologists, to an interest in the role of technology in society; or, to put it in the systemic terms widely used in archaeology, an interest in the relationships between the technological subsystem and the social system as a whole (e.g. Spicer 1952; White 1962; Peltó 1973; Pacey 1983; Lemonnier 1986; for a fuller discussion, see Geselowitz 1987:38-47).

American archaeology in particular has long had a strongly materialist perspective with culture seen as an extra-somatic response between human beings and nature (for discussions, see Trigger 1984:279; Gibson & Geselowitz, this volume). Since technology is generally defined as "the material, mechanical, physical, and chemical instruments, together with the techniques for their use, by means of which man...is articulated with his natural environment" (White 1949:364), it is only logical that technology should be considered a crucial subsystem for the analysis of social change. At a more practical level, technology is perhaps the best preserved social subsystem since archaeologists work primarily with artifacts which are material objects that are the results or fossilizations of technological behavior (Binford 1962:218). In fact, these artifacts actually contain within them a record of the technology of their production (Smith 1981:69).

It comes as no surprise, then, that some archaeologists have been strong advocates of the anthropological study of technology (e.g. Lechtman & Steinberg 1979). If, as Bruce Trigger suggests (1984:276), a main advantage of archaeology over these other social sciences is the great time depth that it can provide, then it is particularly important for archaeologists to analyze the diachronic relationship between technological development and social change, rather than just static relationships between the technological and other social subsystems.

This essay will briefly summarize the metallurgical and social developments specifically of Late Bronze and Early Iron Age central Europe. Here, by definition there was a transition from a bronze-based to an iron-based economy. At the same time there were fundamental changes in the other aspects of society. The various models which have been proposed seeking to link causally the two sorts of changes will be examined critically. If the field can be narrowed to a single hypothesis that fits the facts, then, given, of course, survival in future testing, we will have greatly increased our understanding of social evolution in late prehistoric Europe. At the same time, such a hypothesis will stand as a case study of a "single technology in one culture area," which will add to our accumulating knowledge of the place of technology in society (Lechtman & Steinberg 1979:145).

### **Social-Historical Background**

The first two centuries of the first millennium B.C. in central Europe, which fall into the Late Bronze Age, were characterized by a marked increase in social inequality, as reflected in burial patterns, a proliferation of fortified settlements ("hillforts") which were larger than the other extant settlements, an increase in non-subsistence production, an expansion of specialized labor, and an increase in inter- and extraregional trade. These manifestations are often assumed by scholars to represent the emergence of big-men out of the background of segmentary relatively egalitarian societies (e.g. Harding 1984; but cf. Gibson & Geselowitz, this volume for the possibility that chiefdoms had emerged earlier).

This was also a period of demographic crises in many regions, perhaps due to deteriorating climate, overexploitation of the environment, or some combination of these factors (see Ostojka-Zagórski, this volume). Perhaps not coincidentally, the Late Bronze Age was a time of great technological development in central Europe. Throughout the Bronze Age, bronze had been used mostly for objects of primarily symbolic or aesthetic significance. Even metal weapons and armor may have been more for show than for actual combat (Coles 1977). However, the Late Bronze Age saw an intensification of the traditional European agro-pastoral system that included the use of winter stalls for livestock, the domestication of the bee, and the widespread use of bronze in agricultural implements, such as sickles (Wells 1984:48-53).

There were important developments in pyrotechnology in general--such as the beginnings of true glass production--and in metalworking in particular. Advances in the latter included techniques for hammering and joining bronze sheets, for hollow-casting with plugs, and for casting by the lost-wax method (which probably contributed as much as the demand for honey and mead to the domestication of the bee). New alloys were developed, such as the addition of lead to bronze and the admixture of lead and tin to produce pewter, but most significant was the initial production of iron (ibid:54-57).



There is evidence that there was an effort to conserve bronze. Not only were the new techniques of bronzeworking both labor intensive and materially conservative, but the bronze in the archaeological record appears decreasingly in graves and correspondingly to increasing in hoards. These hoards sometimes seem to be attempts to hide and protect the rare metal, but in other instances are definitely attempts at recycling. The apparent reduction in wealth of the burials could be indicative of the beginning of a shift from a reciprocal to a non-reciprocal mode of exchange, if Walter Precourt's holotheistic analysis (1984) can be expanded to include a dynamic case. In other words, the changed social conditions could have been related to an increased emphasis on inheritance vis-à-vis burial rites, although cause and effect is difficult to determine.

All of these Late Bronze Age developments indicate increased specialization of labor and therefore increased social complexity. Certainly the intensification of agriculture contributed to this situation, even if its origin was in the subsistence needs of growing populations in deteriorating climates. There was as yet, however, no major transformation of the society. It is as if some factors were pulling toward a new level of political hierarchization while other leveling mechanisms pulled in the other direction, leading toward a sort of crisis that needed to be resolved.

In the Early Iron Age, as the name suggests, iron first becomes widely visible in the archaeological record, and it appears to have spread from east to west (Pleiner 1980:376-384). Its primary early appearance is as weapons in male graves. At the same time, various regions of central Europe at different times underwent further social development, likewise first in the east, in the Oder and Vistula river basins of Poland (see Ostojka-Zagórski, this volume) and in the eastern Alpine region, and later in the western Alps at the upper reaches of the Rhine, Danube and Saône basins, largely in the province of Baden-Württemberg.

Contact with the Mediterranean world seems to increase steadily throughout the Early Iron Age, though there are, of course, localized peaks and valleys. At the site of the Heuneburg in Baden-Württemberg, one of the last to undergo a florescence, there is definite evidence of direct Greek contact, which seems to correspond precisely with the foundation of a Greek trading entrepôt at Massalia, modern Marseilles (Wells 1980; 1985:72). Interestingly, the earlier manifestations in east central Europe, although closer to the centers of Mediterranean activity, yield markedly less evidence of direct contact with Greece, instead showing contact with a buffer zone in northern Italy (Wells 1985:75).

The changes reflected in the archaeological record during the Early Iron Age are all continuations and intensifications of the Late Bronze Age trends. The hillforts become larger and more complex, containing even greater capability and specialization in craft production. The political organizations of these population centers are generally conceived to have been chiefdoms (e.g. Rowlands 1984:153; cf. Bintliff 1984b who thinks that chiefdoms began in the Bronze Age, and that the developments of the Iron Age represent the emergence of "paramount chiefdoms"; see Gibson & Geselowitz, this volume for further discussion), and they have been referred to as "(temperate) Europe's first towns" (Wells 1984:79). Prominent examples include Hallstatt, Magdalenska gora and Stična in the east Alpine province and, in Poland, Biskupin.

Despite the nomenclature, iron remained somewhat rare in the Early Iron Age, at least relative to bronze, and therefore, seemingly, a valuable metal. Only in the last four centuries B.C. did "a full-fledged civilization of iron" emerge, a civilization where iron was used through-

out the economy and the society, and in much greater proportion than bronze.

Although it is outside the scope of this essay, it should be pointed out that the Late Iron Age also witnessed the culmination of the earlier social trends, including the formation of tremendous population centers, known as "oppida", from the Latin word for town. The oppida were certainly social, political, and economic centers, and are considered by many scholars, although not all, to be the first urban centers in temperate Europe (see Bintliff 1984b:note 67, pages 195-200 for a discussion of the debate). Ironworking was carried on in the oppida with great intensity, and some of these centers may even have specialized in iron production (Wells 1984:143-149).

The Late Iron Age inhabitants of central Europe had strong trade connections with the expanding Roman polity, and iron was one of their major exports. In fact, after the Roman conquest of this region, it became the center of iron production for the newly formed Empire (ibid:158-170).

### **Technological-Historical Background**

The main problem with trying to understand the role of ironworking technology in social developments of Early Iron Age central Europe is that this technology has not been well understood (Wells 1981:103). Building on the solid work of other researchers (see Pleiner 1980 for a summary of the state of knowledge in 1975), and through the metallographic analysis of a significant corpus of iron artifacts, I have been able to reconstruct the development of metalworking in one subregion of central Europe, the republic of Slovenia in northwestern Yugoslavia. The iron artifacts were drawn from the Mecklenburg Collection of Harvard University's Peabody Museum for Archaeology and Ethnology. The results of this research can be generalized to central Europe as a whole (Geselowitz 1987, in press). A brief summary follows:

By the beginning of the Late Bronze Age, iron was being produced at least sporadically by copper smelters. These craftsmen had for some time been specialized in metal production at least part-time, and even some settlements were specialized in this pursuit. The first reduction of iron must have been accidental, occurring as small globules in copper smelts. The bronzeworkers found that they could add a new metal to their repertoire, but they could not melt it so that they could not apply their full range of metalworking techniques to the new substance, notably casting and alloying.

Occasionally a large piece of iron could be isolated that could be cold-hammered to produce small ornaments, although these were probably not deemed to be as attractive as bronze, silver, or gold. Since the iron so produced tended to have high carbon contents, however, it soon became obvious that the new metal could be made into small hard tools, such as engravers, which were harder than bronze and therefore quite useful in bronzesmithing. As the bronze smelters were either the bronzesmiths or at least closely allied with them, small iron tools became part of the metalworker's tool kit.

During the Late Bronze Age, bronze production became even more specialized, with some artisans spending a great deal of time learning how to shape and treat bronze to conserve metal while achieving spectacular aesthetic results. These bronzesmiths must have been close to full-time in degree of specialization, and it is unlikely that they were very involved in direct agricultural production. They must have been supported by

surpluses produced by other individuals. Feedback between the continued intensification of bronze production and the parallel discoveries taking place about iron probably enhanced both processes.

Given their distancing from agricultural production activities, the bronzeworkers had the time to experiment with the new metal. Several facts soon became apparent. First, iron could be annealed during cold-working to produce thinner objects, and small pieces could be welded together into larger artifacts. Both these techniques were practiced in bronzeworking, but both tended to destroy the superior hardness of iron when applied to this new substance.

Second, certain ores could be smelted directly to produce large amounts of iron, even though the iron itself did not melt. Iron produced in this way was full of slag, but could be refined by hot forging. The metal obtained in this way was, however, softer than bronze and, given its lack of bronze's aesthetic qualities was not considered worth producing in great quantities. So for a time bronzeworkers produced small steel tools for themselves as well as the occasional small steel knife for themselves or perhaps a particular client, but not much else in the way of steel. Uncarburized iron that was accidentally produced was occasionally used for ornamentation, often inlaid in bronze to produce a bold aesthetic effect. There is no evidence that the few steel objects in circulation were limited to wealthy or powerful individuals.

As mentioned above, at the beginning of the Early Iron Age iron began to be produced in some quantity, although still in lesser amounts than bronze, whose production had also increased. Critically, there were no technological innovations to account for this development. Very little quality steel was produced, but what there was is limited in the archaeological record to the wealthier graves. Apparently, although not producing iron because they expected it to be mechanically superior to bronze, the metalworkers recognized a better product when it appeared, and so those objects found their way into the hands, or at least the graves, of the elite members of the society.

The iron weapons of the earliest Iron Age duplicated bronze forms, suggesting both that the bronzesmiths were still producing artifacts of both metals, and a possible conservatism of style. Distinct iron shapes soon developed, however. With apparently increasing demand for both metals, and some difference of technique in their production, the crafts of bronzesmiths and ironsmiths soon began to diverge. The intensifying conditions of the developing Early Iron Age economy certainly allowed for an increased number of specialists removed from direct subsistence production.

Throughout the Early Iron Age, ironsmiths continued to develop their craft. Some smiths became more adept than others, and techniques were presumably passed down within families. Not surprisingly, the best specialists appear to have been supported by the largest, wealthiest communities. There is, however, no evidence that one large community had superior technology to any others. The small communities continued to carry out iron production, at least on a small scale. The main technique that was developed in the Early Iron Age was the ability to forge steel without decarburizing it. This advance allowed the production of large steel objects. Initially, however, this technique was not applied to iron-to-steel welding, though gradually axes came to be improved in this fashion. Furthermore, case- and quench-hardening remained unknown in Early Iron Age central Europe, although case-hardened artifacts seem to have been occasionally imported from northern Italy.

Although it is outside the range of this essay, it should be pointed out that in the Late Iron Age the full range of ironworking techniques became known relatively rapidly. The tools that were then produced were not only easier to obtain than bronze ones, but mechanically quite superior. The transformation of society between the Early and Late Iron Ages can be considered the emergence of a "true" Iron Age economy.

Even within the above outline, extremely sketchy though it is, it becomes obvious why so many scholars have seen the metallurgical and social developments as strongly correlated in the archaeological record, and have therefore attempted to relate them causally. Before proceeding to an actual discussion of models for the role of iron production in the Late Bronze Age/Early Iron Age transition, it might be fruitful to first summarize the factors which any such model must take into account.

### **Considerations for Modelling the Developments**

The earliest models for explaining these changes, both in social and metallurgical spheres, were migrationist and hyper-diffusionist: they were based on the assumption that the knowledge of ironworking must have arrived in central Europe along with actual immigrants. These immigrants would have used their superior technological knowledge to gain ascendancy over the indigenous inhabitants, although possibly also exploiting existing local mechanisms for social and political advancement. The hillforts would have been the residences of these foreign chiefs, who would have derived their concepts of rulership from the more "advanced" cultures of the Mediterranean. Subsequent developments would have represented the arrival of new ideas, techniques, and/or individuals (Childe 1925).

As mentioned above, more recent archaeological research has revealed that the more salient developments of the last millennium B.C. in central Europe are distinguished by continuity rather than disruption, and the hyper-diffusionist approach has generally been rejected. The number of cases where actual migration could be proven to the satisfaction of modern archaeological theory (e.g. Rouse 1986) are quite limited. Furthermore, there has been a trend in anthropology to view as important how and why new ideas are adopted into societies, not where those ideas ultimately originated.

Any model seeking to relate the development of the ironworking technology to the other social changes must account for this continuity in the archaeological record of late prehistoric central Europe, for the sequence of events described above, and for the following facts:

First, as described above, the development of ironworking in central Europe was as gradual a process in central Europe as it was elsewhere in Europe (e.g. Ehrenreich 1985) and in Asia as well (Maddin n.d.). I see this gradual development over a very long period of time, and the concurrent existence of more advanced techniques in neighboring regions as indications that ironworking was a development indigenous to central Europe (Geselowitz 1987), while most leading scholars still see the knowledge of ironworking as having diffused from the Mediterranean region (Pleiner 1980, 1981; Maddin pers. comm.). For the problems raised in the current essay, however, this debate is moot. As will become apparent below, I recognize high levels of communication between central Europe and the Mediterranean region throughout later prehistory, and I do not hold any *a priori* biases for rejecting the diffusionist argument. It is just that the data, as they exist today, are not sufficient to demonstrate the transfer of ideas. Again it must be stressed that here, in keeping

with current archaeological paradigms, we are only concerned with how and why the various aspects of the technology were incorporated into the social system, and what the outcome of this process was, regardless of the original source of the techniques.

The second consideration for the study of early iron metallurgy must be the socially significant properties of iron *vis-à-vis* bronze, the previous metal of choice in central European communities. I have described above the mechanical and practical differences between bronze and iron. However, we must keep in mind the substantivist tenet that value is culturally determined, and, despite the difficulties in testing reconstructions of symbolic systems (Gibson & Geselowitz, this volume), any hypothesis concerning the reasons or results of a shift from a Bronze Age to an Iron Age economy must attempt to control for ideological components of the two technological subsystems.

Keeping these considerations in mind, a critique will be put forward of the major models that have been proposed to explain the role of ironworking in the rise of social complexity in late prehistoric central Europe. These models can be grouped into three categories: iron as a means of production, iron as a means of destruction, and iron as a commodity.

### Previous Models

The first class of models that have been proposed can be grouped together as focussing on iron as a means of production. It has always been tempting to see the adoption of ironworking at the beginning of the Early Iron Age as a mechanism that allowed increased agricultural productivity, which in turn required the intensification of labor while allowing increased population density. The apparent strains of the Late Bronze Age can be seen as a demographic crisis which the existing subsistence techniques, even with an increased use of bronze, could not solve. Thus, as proposed in general by Esther Boserup (1965), the technological development enabled or, in fact, required the increased level of social complexity in Iron Age Europe (Bintliff 1984b:174).

John Bintliff (*ibid*) points out that population seems to have grown steadily throughout prehistory rather than having grown by achieving a series of plateaus, although with localized spurts and regressions caused by over-exploitation and environmental change. He therefore adopts a consciously "neo-Malthusian" view of population as an independent variable. The independent adaptation of iron allowed the population in some areas to reach a new threshold, rather than going into its normal cyclical decline (*ibid*:160). Again, the new levels of intensification and population density would have necessitated social developments.

The problem with both of these similar demographically based models is that there is no evidence for iron revolutionizing the subsistence economy until at least the Late Iron Age (Barker 1985:110). As discussed above, iron tools at first would have been found to be inferior to those of bronze; any advantage would have to have accrued from the relative plentifulness of the former material, and we would expect to see a good deal of evidence for iron tools in the archaeological record.

Again, the earliest widespread use of iron was in weapons, and these are found primarily in graves. Settlement excavation from the Early Iron Age has been limited, but iron tools are not found in great numbers. Bronze tools are rare on settlements as well, occurring mostly in hoards (Geselowitz 1987:82ff.). One could argue that since the advantage of iron was in its plentifulness, and since the labor-intensity of its production

was in forging the final forms more than in the smelting, that we would not expect to see iron in hoards, whether those hoards were for recycling of or protection of wealth. Until clear evidence does emerge of the proliferation of the application of iron to the subsistence economy of the Early Iron Age, however, such models can be considered to be, at best, premature.

Janusz Ostoja-Zagórski (this volume), also argues that iron had little to no effect on the population. Although his model also focuses on population density as the crucial variable, he sees the early adoption of ironworking as having no major effect in that area. In fact, his is one of the few models to suggest that the development of ironworking technology and the other social changes were probably not causally linked at all.

In final reference to iron as a means of production, a Marxist model might suggest that there was something inherent about the adoption of iron that increased the ability of the emerging Bronze Age elites to monopolize these means of production. The problem with this view is that, intuitively, the commonness of iron should have mitigated against central control, control which could have been much more pronounced in the distribution of bronze. Bintliff (1984b:174) has even pointed out that iron seems to spread most markedly outside of the elite sectors.

Other models have done better at taking into account that the earliest widespread use of iron was in weaponry. Although there are slight variations in these models, they can be summarized as focussing on the role of iron as a means of destruction, or at least as a threat of destruction. Jan Bouzek (1985) has pointed out that one response to the crisis of the Late Bronze Age could have been a sociopolitical reorganization. Increased intersocietal competition would have led to increasing conflict. The group that best organized for conflict would have been able to seize the resources of others, including their persons as slaves, and thereby support and propagate their greater complexity. Bouzek stresses the environmental cause of the crisis, but the importance of the model is its description of how the various social changes, including the adoption of iron, may have occurred.

Since object for object iron weapons would have been inferior to bronze weapons in the Early Iron Age, the basis for the military superiority of a particular group or groups would have to have been based upon taking advantage of the plentifulness of iron. Such a strategic reorganization may have taken place in Iron Age Greece, and the adoption of the hoplite system may have been an important factor in subsequent Classical developments, such as the emergence of Greek "democracy."

It is true that weapons of metal seem more widely distributed among the male populace of central Europe in the Early Iron Age than in the Bronze Age. While spearheads and axes occur in the Bronze Age, long slashing swords seem to have been the weapon of choice, at least as reflected in mortuary contexts. In the Early Iron Age, on the other hand, swords virtually disappear from the graves, and the standard compliment of iron weapons becomes an axe, two spears, and a short stabbing dagger.

The data seem to suggest that warfare in the Bronze Age was of the "heroic" type and, as pointed out above, the bronze weapons and armor were better suited for "parade and display" than for actual combat (Coles 1977). Iron would have been inferior to bronze for actual fighting in most contexts, but would seem even less suitable for display, at least to modern eyes. The return of swords in the beginning of the Late Iron Age, at a time when the technology of iron production had improved, would match the archaeological evidence for decentralization, destratification, and a

return to "heroic" warfare. Certainly our textual sources concerning the Early La Tène Celts do not suggest highly organized military organizations along the classical Greek lines.

Possible lines of evidence mitigating against this hypothesis are the lack of evidence for slave-taking in Early Iron Age central Europe (Arnold, this volume), and some textual evidence that suggests that "heroic" warfare was still the norm. Furthermore, the strength of the new military system must have been in arming a broader cross section of the society, so it is not entirely clear why greater stratification should have occurred within social groups, as opposed to the subjugation of outsiders. Of course, a military hierarchy would have been necessary, and this could be what is reflected in the graves. Overall this hypothesis must be considered quite robust given our current state of knowledge. It could also take on a Marxist slant if the violent potential of iron is considered to have been applied between classes rather than between social groups.

The final set of models see the iron as having importance as a commodity in far-flung trade networks. Some earlier models had seen the Late Bronze Age as a time when social disruptions cut off the traditional access to bronze, and caused an increase in iron production, which led, in the Early Iron Age, to the formation of hubs of new trade networks. While such a mechanism may well have been at play in the Near East, our current understanding, on the contrary, suggests that the supply of bronze was never cut off in central Europe, where both copper and tin are locally available, and that in fact both bronze and iron production increased in the Early Iron Age. Nor is it clear how reliance on widespread iron could produce even more centralized trade systems than had use of the restricted resources copper and tin.

Newer models tend to emphasize the role of central Europe in a growing Eurasian economy, perhaps directly analogous (see Bintliff 1984a:30) to the modern capitalist "world system" of Wallerstein (1978). In this view growing demand for commodities by expansionistic Mediterranean states led to a restructuring of peripheral societies including, in the case of central Europe a sort of pre-capitalist disembedding of the economy from political organization (Rowlands 1984:153). Although it is not clear that the economy can ever be said to be disembedded (see Gibson & Geselowitz, this volume), this model does have some advantages. Certainly in the developments in west central Europe toward the end of the Early Iron Age, direct Mediterranean trade was involved (Wells 1980).

Can this type of model also explain the earlier developments in east central Europe? The east Alpine towns of the beginning of the Iron Age were certainly tied into long-distance exchange networks (Wells 1984:85), but it is not clear that exotic materials had not also been available in the Bronze Age. The evidence for direct contact between central Europe and the Mediterranean world is actually quite limited, although there is a great deal of evidence for contact between central Europe and allied peoples in northern Italy, and in turn for those people of Northern Italy with the Mediterranean (Geselowitz, in press).

In examining trade there is always a problem of commodities that do not survive archaeologically, but the position of east central Europe might also have a bearing on the types of evidence we would expect to find. Arthur Ray (1978) has demonstrated one case where ethnohistorically documented middlemen were invisible in the archaeological record because they kept none of the goods from either end of the exchange network. They would use them for a time, then pass them on, replacing them with new

items. Thus breakage and discard visible in the archaeological record occurred only outside of the middleman zone. East central Europe is ideally situated for middlemen for trade between the rest of temperate Europe with the Mediterranean.

The weakness in this model is that it does not satisfactorily explain the use of iron in central Europe itself. If the central Europeans were middlemen, and possibly producers of iron for export, why the internal consumption of iron? If the trade was based on Mediterranean peoples offering what they had--wine, olive oil, coral and shell--for what they did not--iron--to central Europeans in a reversed supply situation, then there is no reason that iron should have entered general use on the local central European scene. The peoples of the Mediterranean could already produce high quality steel, and this could have been done with wrought iron obtained from the north. Finished products directly from the north would not have had value to them. The exchange would have been most efficient if iron would have been produced or obtained in ingot form. While we might expect iron to become a medium of exchange internally in central Europe, since it had this external value, it is not clear why it should have been made into weapons and deposited into graves.

One explanation could be that the demand for iron by foreigners--who in fact supplied in return a number of valued commodities--did indeed begin to raise the perceived value of iron within central Europe. Accordingly, iron may have gradually gained acceptance as a substitute for bronze not just in exchange, but also in display and other social roles, and so could have been used to replace bronze as weapons and grave goods. So, although iron was not at first a prestige good, it could be exchanged for prestige goods, and thereby may have gained prestige itself. This development would have been particularly likely if the economy was beginning to move toward a market form. In a market economy, value is more likely to be identical with simple exchange value, since categories of wealth become of a more general purpose (Geselowitz 1987:193-194).

Peter Wells has proposed a similar model, but one which allows the adoption of iron to be a local affair. Phrased in formalist terms, this model sees the internal exchange networks of east central Europe as the crucial factor in the social developments, although it is general enough to allow a role for external trade (Wells 1981, 1984, this volume). In fact, Wells sees the later developments of west central Europe as being more pronounced in terms of social and political stratification, due to its location *vis-à-vis* foreign trade (1985). In Wells' view, the crisis of the Late Bronze Age, combined with the traditional exchange patterns that existed provided a window of opportunity for individuals to invest in iron production and accumulate wealth (1984:98). Wells feels that it *does* matter exactly to what use the iron was put; the "possibilities of gain in the industrial production" were sufficient to start to shift the whole economic system, as various feedback mechanisms came into play (*ibid*). If iron could have replaced bronze in any way, those who first produced the iron would have excess bronze to reinvest in the system, enabling them to hire more iron specialists, more bronze specialists, and so forth. The villages of these early "entrepreneurs" would have become towns, as farmers would have been attracted to them to supply produce to fuel the system, in exchange for some of the increasingly available luxury goods (*ibid*:99).

Wells intentionally and explicitly avoids a specific discussion of sociopolitical hierarchization (*ibid*:34-35), as he feels that the individual is the appropriate unit of analysis. His "entrepreneurs" (*ibid*:30-31) were individuals who had accumulated greater wealth than their contemporaries, and began to use this wealth within existing



economic systems to multiply their advantages.

It is obvious that these individuals must have been "big-men" in the common anthropological parlance, following the scheme of Elman Service (e.g. 1962). The fact that in west central Europe a big-man may have become a "potentate" (Wells 1985:85) would then be reflecting a transformation from a tribal society to a chiefdom. Although Wells does not use this terminology, it is clear that he definitely thinks there was not political centralization during the early developments in east central Europe (ibid). In this latter case he sees the existence of foreign trade as important, but considers internal exchange mechanisms to be the key to understanding the changes in central Europe (Wells 1984:97-99).

Although this model does not require an explanation for the use of a material whose value lay outside the society, nevertheless it, too, fails to explain in just what way the iron would have been used--what its "possibilities of gain" were.

### A Model for the Changes

I think that Wells' general model may serve as our best working hypothesis for the rise of social complexity in the Early Iron Age, if we re-embed the economy in the greater social system. To recap the social situation, in the Late Bronze Age there was increasing population, intensification of production and expanding specialization of labor. Furthermore bronze, a restricted resource, was acquiring an ever greater role in subsistence production. A number of factors were therefore pulling toward greater sociopolitical complexity, working against mitigating conditions, which seem to have been mainly social.

It seems evident that, as Wells has suggested, any shift toward the production of iron by a specific group would precipitate the transformation that we see in the archaeological record of the Early Iron Age. However, it is difficult to perceive how an "entrepreneur" could have made this decision consciously, when the interconnected sequence of events that would have begun could not have been obvious to the prehistoric individual, even as its exact nature is the subject of intense debate among scholars today, despite our advantage of hindsight. Wells fails to delineate any simple instant economic benefit of iron that would have enticed the entrepreneur to begin iron production, given our current model of level of ironworking technology.

If, on the other hand, we consider what the appearance of iron meant for the *political economy*, as opposed to an economy disembedded from the sociopolitical system, then new light is thrown on the picture. Our current reconstruction is that iron first appears as weapons in graves in lieu of bronze prototypes, but mechanically inferior to the latter. If the idea is correct that the nature of warfare was that the bronze was used primarily for display, then iron weapons certainly could have been used in life, but it seems unlikely that an individual who had access to bronze would have settled for iron equivalents.

However, the burial of a warrior with iron weapons means that his bronze weapons were still extant in the society. In other words, the presence of iron weapons in graves does not mean that the Late Bronze Age shift toward increased inheritance had been reversed, but that a substitute for a valued commodity had, for the grave context, been found. This substitution enabled the dead to be honored while their heirs could maintain their position in the trading system. Wealthy individuals thereby became wealthy lineages, leading to a conical clan-type arrangement, and

reciprocal exchange relationships could move toward more centralized redistributive systems.

Only after the changes took off, and more iron specialization occurred, might the iron specialists have found out about the demand for iron at the southern end of the trade network. There is no need, in the absence of data, to imagine traders from the Mediterranean arriving and trying to persuade the Late Bronze Age inhabitants of east central Europe to produce more of a material that the latter considered worthless, although this may indeed have occurred later in west central Europe. In fact, the foundation of Massalia may have been the way in which Mediterranean societies not well situated for the existing northern trade tried to tap into central European resources, iron included.

An ideological shift to conserve a scarce resource of the sort suggested here may be uncommon, but it is by no means unknown in other cases. Both Chinese emperors and Egyptian pharaohs were buried with models of objects that their earliest predecessors received in reality. The Iteso tribe of Uganda had a traditional economic system based on cattle as units of wealth. Cattle hides were a medium of exchange and were also used to wrap the dead for burial. Early in the twentieth century, under pressure from rinderpest and colonial expansion, they began to wrap their dead in imported mass-produced fabrics, although the basic economy had not yet changed (Lawrence 1957:99).

Perhaps this last case is an inappropriate analogy because of the nature of colonialism in Africa, although certainly the Mediterranean states in prehistoric Europe were capable of exerting tremendous pressure on the indigenous cultures of central Europe. As mentioned above, others have compared the prehistoric European situation directly to the capitalist world-system.

It is interesting to note that V. Gordon Childe saw the Chinese and Egyptian cases as examples of a general law of mortuary practice in which graves grow poorer as stable societies grow richer in material wealth (Childe 1945:16), an idea perhaps related to Precourt's model about the role of a market economy in inheritance patterns, discussed above. Recognizing an apparent exception in prehistoric central Europe, Childe decided that migrations had made Early Iron Age Europe essentially unstable, even while increasing its material wealth (ibid:17). It is now generally felt that there was cultural continuity in the Late Bronze Age/Early Iron Age transition, but the poor quality of iron artifacts in the graves combined with the common occurrence of iron in central Europe may mean that these graves did indeed contain less of "value" than those that preceded them. In any event, it is easier to imagine stresses on the institution of burial rite leading to a change in that institution, rather than an individual consciously deciding to violate existing ideological norms.

A great deal of archaeological research has recently gone into the question of the meaning of mortuary practices and, if there is a consensus, it must be that the picture is far from clear (for a recent discussion, see Bartel 1982). That is clearly the case with the constantly shifting, never uniform grave rites of prehistoric central Europe. There is always a problem with structuralist approaches to the archaeological record (Gibson & Geselowitz, this volume). In this instance it has been assumed that it is ideologically possible for iron to have replaced bronze in mortuary contexts. Just because we today scientifically "know" that both materials are of the same class, that is metals, did prehistoric Europeans feel the same way? Although it is "obvious" that copper, tin, iron, and so forth share certain physical properties (even without

understanding the underlying physics, as we do today), this is not a sufficient argument.

The actual evidence that bronze and iron would have been categorized together in prehistoric Europe is of two sorts. First, there is the physical evidence that the bronzeworkers and the ironworkers were one in the same, that is metalworkers. We have no idea, however, how they considered the relationship of their two activities. Second, we have direct historical evidence that Early Medieval metalworkers considered bronzeworking and ironworking to be related, although this was of course after the Roman interlude and its various influences.

In any event, I do not mean the above scenario to be taken as a causal chain, with ideology as the "prime mover" in the social changes. Certainly one could make that claim, or conversely one could make a Marxist argument that the prime cause of change was the shifting mode of production and the resultant contradiction in the system was "solved" by conscious manipulation of the ideological system.

I rather seek to suggest a working hypothesis rooted in the paradigm that society is an adaptive system which responds to changing situations in meaningful ways, albeit in ways restricted by the history and current state of the system (see Gibson & Geselowitz, this volume). In analyzing that system and those changes, we must realize that all of the subsystems are interconnected, and that none is disembedded from the society as a whole. Certainly in this case we must consider that, as the substantivists have suggested, the political economy is not separate from the social and cultural spheres, and ideology must be taken into account in the final reckoning.

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DIET, STATUS, AND COMPLEX SOCIAL STRUCTURE IN IRON AGE CENTRAL EUROPE:  
SOME CONTRIBUTIONS OF BONE CHEMISTRY

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*Science, like the course of civilization itself, advances at an accelerating pace. So also does the application of science to the task of unfolding the unwritten history of man's changing relation to his environment, his advance towards a more complete and rational exploitation of natural resources in the interests of a fuller and more complex social life.*

(Clark 1970:20)

These words by Grahame Clark introduced the second edition of a volume exploring the increasing role of interdisciplinary research on archaeological problems, particularly the evolution of complex forms of human behavior and organization. Since 1970, the applications of scientific methods in archaeology have continued to increase in number. In the past decade, methods based on bone composition, including carbon and nitrogen stable isotope ratios in bone collagen and trace element concentrations in bone mineral, have been applied to aspects of diet, subsistence and social structure (work summarized in van der Merwe 1982; Klepinger 1984; Price et al. 1985; DeNiro 1987).

In the continuing spirit of these interdisciplinary adventures, this paper presents the preliminary results of analyses of bone collagen from a small number of human skeletons recovered from the Early Iron Age (Hallstatt period) cemetery of Magdalenska gora in Slovenia, Yugoslavia. We propose that such results are useful in attempts to understand the nature of social structure in the early Iron Age. The number of samples analyzed is too small to address the evolution of the system in this paper, but in keeping with the diachronic and processual orientation of this volume suggestions are made concerning the applications of the method to a broader context. It is hoped that the promise of this endeavor will be apparent.

### The Problem

The Early Iron Age (800-400 B.C.) in central Europe was characterized by the emergence of large defended commercial and industrial settlements associated with tumulus cemeteries of considerable complexity. Recent research has stressed the importance of the dynamics of subsistence and

production systems and the control of the flow of goods in the evolution of this complex society (Frankenstein and Rowlands 1978; Renfrew & Shennan 1982; Wells 1980, 1981, 1984; Bintliff 1984).

Reconstructions of the social structure based on the traditional methods of archaeological mortuary analysis are varied. This is true in particular for southeastern central Europe and the earliest emerging Hallstatt period commercial and industrial centers. While certain similarities show that contact existed between the West and East Hallstatt period communities, differences in material culture and burial ritual distinguish the West (southern Germany, northern Switzerland and eastern France), and the East (alpine Austria, Bohemia, East Germany, Poland and Slovenia) Hallstatt culture areas. Recent research on the general Hallstatt phenomenon across central Europe has either stressed or deemphasized these differences.

Wells (1985) has stressed the differences in the presence of imports, burial placement within the tumuli, and inequalities in the quantities and kinds of burial offerings between the western and eastern Hallstatt culture areas. Based on these differences he suggested that positions of status in Slovenia were less clearly defined and structured than in the West. The "clan" or "family" tumuli of Slovenia (Gabrovec 1974) are characterized by a continuum of burial wealth. This has been interpreted as an expression of fairly equal access to goods (Wells 1981). Those few graves that contain diverse burial goods are found spread among all tumuli. Wells proposed a model of enterprising family heads of equivalent status who were able to use their personal abilities to organize and be catalysts to increased production for personal and community gain, but who differed little in status from their contemporaries (Wells 1981).

A contrary interpretation was proposed by Bintliff (1984) who emphasized certain similarities that exist in the burial structures of the West and East Hallstatt culture areas. For example, the Great Tumulus at Stična, Slovenia, one of the few such structures in the East excavated by modern methods, contained a circular pattern of burials surrounding a central core. Though the core at Stična was empty, Bintliff compared the circular interment pattern to that of the Magdalenenberg tumulus in southwest Germany, whose central burial, while plundered in antiquity, contained the remains of a wagon and horse trappings, considered to be high status burial goods. Based on this similarity, Bintliff suggested the existence of a strict hierarchy of status levels in Slovenia similar to that apparent in the burial structures of the West Hallstatt culture area.

Biba Teržan (1985) defined distinct status groups in a similar fashion in Slovene cemeteries. Based on the presence of weapons or iron knives as male burial goods, and rings or beads as female goods she identified several groupings at Magdalenska gora. The group of highest status and power according to Teržan was made up of warriors, who by the late Hallstatt period had fragmented into five distinct sub-groups identifiable by the combination of various weapons in the burials. The leading sub-group was characterized by a full complement of two spears and an axe, and was the group from which the leading high status individual, the "prince" and "paterfamilias" emerged (following Teržan 1985: 100).

It is apparent that contrasting approaches to the burial data have produced differing interpretations of the social structure: either the status differences among community members were slight and informal, or the status differences were marked and formal. A method independent of traditional mortuary analysis is needed to test these inferences. As Ian Hodder (1982) has argued, the burial ritual should be seen as a transformation rather than as a clear mirror of the status and life of the



individual. It is perhaps useful in this context to look at evidence concerning the life of that individual rather than the death!

## The Materials

As an independent test of the contrasting interpretations of early Iron Age social structure in Slovenia, a sample of human skeletons from Magdalenska gora were selected for analysis of certain aspects of bone composition. Magdalenska gora, a hillfort and associated tumulus cemetery, is located along the Sava River in the hilly pre-alpine region of north-western Yugoslavia. The settlement is as yet unexplored, however between 1908 and 1913 at least nine of the large tumuli were excavated with considerable enthusiasm by the Duchess Paul Friedrich of Mecklenburg. The Duchess, an ardent amateur archaeologist and wife of the Prussian duke, explored the prehistoric monuments on her ancestral lands of Carniola, modern day Slovenia. After her death the material eventually passed to an auction house in New York, and was finally purchased by the Peabody Museum in two stages, in 1934 and 1940. Most of the material, encompassing 359 burials, is preserved in the Mecklenburg Collection of the Peabody Museum at Harvard University (Hencken 1978).

The Duchess did not systematically collect the human remains from her investigations. Angel (1968) was able to determine the sex and general age group of only 32 individuals from Magdalenska gora, 20 of which have secure grave contexts. These 20, comprising 5 females and 15 males from Tumuli IV, V, and X, were selected as the sample for analysis of stable carbon and nitrogen isotope ratios in bone collagen.

Regrettably, skeletal remains from the richest and most diverse burials of the cemetery, such as the "situla grave," Grave 6-7-7a in Tumulus V, and the "horse burial," Grave 29 in Tumulus X, are not preserved. Nevertheless, the 20 burials available have parameters that are potentially significant in studying the pattern of diet and status groups. These include sex, age, presence or absence of weapons, presence or absence of grave goods, and tumulus membership.

The burials range in date over a period of 400 years, but due to the small size of the sample all individuals are considered as a single cohort. The effect of this discrepancy is reduced by the fact that nearly all of the dateable burials (9 of 13) cluster in the latest phase (Negau, 450-300 B.C.) of the Slovene early Iron Age (Hencken 1978).

In order to reconstruct aspects of human diet it is necessary to know the items that constitute the daily subsistence of the community (Bumsted 1984). This includes the plant and animal resources exploited and their respective isotopic compositions. Such information from Magdalenska gora and the surrounding area is not available. Few analyses of nitrogen and carbon stable isotope ratios in faunal bone collagen or in plant material have been performed on European material. In general, the few data have been restricted to the reconstruction of marine and terrestrial components of the diet of prehistoric coastal populations in Denmark (Albrethsen & Brinch Petersen 1977; Tauber 1981).

Information gathered from other sites across Europe, however, indicates that the people of the European Iron Age exploited a wide range of domestic and wild species. Animal resources included cattle, sheep and goat, pig, dog and horse, red and roe deer, boar and various other small wild animals, fowl and small quantities of aquatic foods (Amschler 1939a, 1939b; Boessneck 1971; Boessneck & Stork 1972; Bökönyi 1974; Clason 1979; Benefit 1983; Bartosiewicz 1985). An assemblage of animal remains,

including cattle, sheep/goat, pig, horse, dog, feral pig, beaver and hare (identified by G.P. Greis, Harvard University), from the early Iron Age settlement of Altdorf, Bavaria, West Germany (Wells 1986) were analyzed in order to approximate the isotopic composition of the faunal contribution to the early Iron Age diet. These fauna are comparable to those we would expect to find at Magdalenska gora. Furthermore, the similarity of the two sites in terms of latitude and period of occupation support the assumption that fauna from Altdorf will have bone collagen stable isotope compositions representative of fauna exploited by the Magdalenska gora community.

Floral remains from early Iron Age contexts in central Europe include cultivated wheats, barleys and millet, supplemented by oats and rye, legumes and small amounts of collected wild fruits, nuts, grasses and leafy plants (H. Werneck 1961; Hofmann 1964; W. Werneck 1970; Knörzer 1971, 1980; van Zeist 1975; Körber-Grohne 1981; Quillian 1983). The isotopic compositions of European plant remains have yet to be studied systematically. Nearly all of the domesticated species, however, have been tested from other contexts (Bender 1968; Smith & Epstein 1971), and carbon isotope ratios for other species are available in the journal *Radiocarbon*. These published values are used to approximate the carbon stable isotope composition of the floral contribution to the early Iron Age diet. Nitrogen isotope ratios for European plants, however, have not been published. In order to reconstruct the nitrogen stable isotope composition of the plant diet it will be necessary to analyze these plants. This work is in progress in the Bone Chemistry Laboratory at Harvard University.

## The Method

The method used to address the problem of social structure in burial contexts has two working bodies of method and theory: a body of mid-range anthropological theory concerning status and diet in complex society, and bone chemistry.

Explicit in the body of anthropological theory concerning the evolution of formalized status and rank groups in complex society are mechanisms of social differentiation, or sumptuary laws, which legitimize, regulate and differentiate the behavior of status groups (Childe 1951; Fried 1967; Service 1971, 1975). These mechanisms are often in the form of dietary privileges (Service 1971). Ethnographic and archaeological research from North America, Mexico and Africa (Oberg 1940; Spores 1965; Haviland 1967; Hatch & Willey 1974) has documented complex societies where status distinctions involved preferential access to foods of greater nutritional value, often including stock or hunting produce.

Such mechanisms of social differentiation through unequal access to subsistence products are implied for Iron Age Europe (Frankenstein & Rowlands 1978; Wells 1980), although direct archaeological evidence of these mechanisms is ambiguous. This may be due primarily to the paucity of well-excavated settlements with clearly defined elite structures and carefully recorded floral and faunal remains (for a discussion of this general problem in the West Hallstatt culture area see Härke 1979). A study of animal remains from Hallstatt period burials (Koreisl 1934) suggests that hunted animals may have been placed in the tombs of select individuals; perhaps this is a hint of the privileged access to game animals which was to become more pronounced by the early Middle Ages (for example Müller 1973). For a society with strict status distinctions dietary evidence of these mechanisms would be expected. Conversely, for a society where status distinctions were not formally maintained, evidence of a more homogeneous diet would be expected.

Bone stable isotope chemistry involves the analysis of stable isotope ratios of carbon and nitrogen in the organic portion of bone (collagen). These ratios are compared to standards and are expressed as *delta* values (*delta* 13C and *delta* 15N) in parts per thousand (o/oo) as shown below.<sup>1</sup> For a more detailed presentation of this method see Price et al. 1985:429-431.

The underlying principle of stable isotope analysis is that the stable carbon and nitrogen isotopic composition, or signature, of the diet of an animal determines the carbon and nitrogen isotopic signature of that animal's bone collagen (DeNiro & Epstein 1978, 1981). In archaeological terms, what an animal consumed in life remains recorded in the bone collagen after death.

Significant food groups can be recognized by their isotopic composition (DeNiro and Epstein 1981; van der Merwe 1982). A variety of tropical grasses (referred to as "C4" plants), including important domesticated crops such as maize and millet, utilize CO2 during photosynthesis in a more efficient manner than do most plants (the so-called "C3" plants) (O'Leary 1981). This greater efficiency results in stable carbon isotope ratios which are more positive than those found in "C3" plants (Bender 1968; Smith & Epstein 1971; Downton 1975; Raghavendra & Das 1978; Burleigh et al. 1984). "C4" plants have an average *delta* 13C value of -12.5o/oo; the mean value of "C3" plants is about -27.0o/oo (Price et al. 1985). Numerous studies have taken advantage of this difference to test hypotheses about prehistoric human dependence on maize (Vogel & van der Merwe 1977; van der Merwe & Vogel 1978; Bender et al. 1981; DeNiro & Epstein 1981; Price & Kavanaugh 1982; Farnsworth et al. 1985; Schwarcz et al. 1985).

A compilation of plant stable carbon isotope ratios from the journal *Radiocarbon* shows that Europe is a largely homogenous "C3" plant regime with an average *delta* 13C value of -25.2o/oo (Burleigh et al. 1984). One plant found on Iron Age European sites is an exception. This is millet, a tropical grass which is present in small quantities on sites in central Europe by the late fifth millennium B.C. (Barker 1985). Bender's (1968) analyses of several millet species (*Panicum sp.* and *Setaria sp.*) yielded results with a mean *delta* 13C value of -14.3o/oo. Thus far, millet appears to be the only "C4" plant of any importance for human subsistence during the European Iron Age.

Certain food groups have similar isotopic signatures and thus are difficult to distinguish on the basis of stable isotope ratios. For example, marine plants and organisms have relatively positive stable carbon isotope ratios, and therefore 'mimic' the isotopic signatures of "C4" plants in the diet of their consumers (Tauber 1981; Chisholm & Nelson

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1

$$\delta 15N = \left[ \frac{(15N/14N)_{\text{sample}}}{(15N/14N)_{\text{standard}}} - 1 \right] \times 1000 \text{ o/oo}$$

$$\delta 13C = \left[ \frac{(13C/12C)_{\text{sample}}}{(13C/12C)_{\text{standard}}} - 1 \right] \times 1000 \text{ o/oo}$$

The standard for *delta* 13C measurements is the Peedee belemnite (PDB) carbonate, while that for *delta* 15N measurements is atmospheric (AIR) nitrogen.

1982; Chisholm et al. 1983; Hobson & Collier 1984; Schoeninger & DeNiro 1984). The presence of these "rival" food groups must be carefully considered in dietary analysis.

Recent studies compiling nitrogen isotope ratios have suggested that these ratios may be used to discriminate between organisms in different trophic levels (Schoeninger & DeNiro 1984, Schoeninger 1985). One potential complication, however, is the fact that marine foods have stable nitrogen isotope ratios that are more positive, on average, than those ratios in terrestrial foods. For this reason marine foods can have stable nitrogen isotope ratios similar to those in terrestrial foods obtained from upper trophic levels. In the absence of marine components in the diet, however, nitrogen stable isotopes may be useful in indicating the relative consumption of animal products, such as meat, milk and blood.

Bone collagen was extracted from 20 humans and 9 animals using the procedure presented by Schoeninger & DeNiro (1984). The collagen was combusted using a modified version of the Stump and Frazer method (Northfelt et al. 1981). The carbon dioxide and nitrogen gases were purified and separated in a vacuum system using cryogenic distillation. The isotope ratios were then determined by mass spectrometry.

## Results

The results of the stable isotope ratios of the fauna and human bone collagen are listed in Table 1 and are summarized in Figure 1. A distinct separation of the nitrogen isotope ratios from the human and animal sample populations is obvious, thereby illustrating the "trophic level effect" (Schoeninger 1985). The only meat eating animal sampled, the dog, falls within the range of the humans ( $\delta^{15}\text{N} = +9.30\text{‰}$ ). This suggests that the nitrogen stable isotope ratios obtained may be helpful in reconstructing the relative quantities of animal products present in individual diets. Although we recognize that camp dogs are not complete carnivores, the difference in  $\delta^{15}\text{N}$  values between the herbivorous faunal sample and that of the dog probably reflects the ingestion of animal products on the part of the dog. Among the human samples, the results cluster with the exception of one old aged male, who occurs within the range of the herbivorous fauna. This anomaly is discussed in more detail below.

Table 1. Symbols

- #: G = genus (for Altdorf)  
Gr = tumulus and grave (for Magdalenska gora)
  - +: %col = Percent (by weight) collagen extracted from each sample
  - \*: The values given represent averages of two determinations of the stable isotope ratios, with the exception of the  $\delta^{13}\text{C}$  value given for sample #MS2627 which is the average of three determinations. Replication of the  $\delta^{13}\text{C}$  values was achieved to within an average of  $0.30\text{‰}$ ; replication of  $\delta^{15}\text{N}$  values was within an average of  $0.40\text{‰}$ .
- Key: & graves with weapons  
@ graves without goods

Table 1.

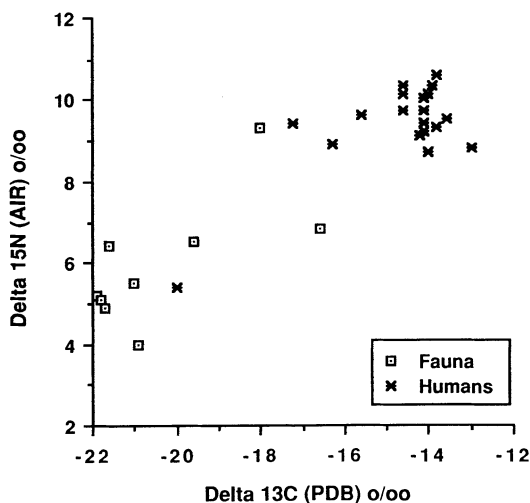
Sample# G/Gr# sex age %col<sup>+</sup> C/N delta13Co/oo delta15No/oo Key

**Altdorf**

2611	<u>Bos</u>			5.3	2.7	-20.9±.029*	4.0±.020	
2612	<u>Ovis</u>			n.a.	2.6	-21.7±.019	4.9±.038	
2613	<u>Ovis/Capra</u>			12.6	2.7	-21.6±.036	6.4±.034	
2614	<u>Sus</u>			12.4	2.8	-19.6±.017	6.5±.031	
2615	<u>Sus</u> (feral)			4.9	2.7	-21.0±.020	5.5±.038	
2616	<u>Equus</u>			2.7	2.6	-21.8±.028	5.1±.017	
2617	<u>Canis</u>			10.9	2.9	-18.0±.019*	9.3±.046*	
2618	<u>Lepus</u>			6.3	2.7	-16.6±.044	6.8±.025	
2619	<u>Castor</u>			2.7	2.7	-21.9±.037	5.2±.017	

**Magdalenska gora**

2620	IV/3	M	YA	9.2	2.9	-15.6±.054	9.6±.042	&
2621	IV/10	M	MA	5.0	2.7	-14.1±.044	9.4±.016	@
2622	IV/25	M	MA	8.9	2.8	-16.3±.042	8.9±.020	&
2623	IV/30	M	OA	7.2	2.7	-20.0±.015*	5.4±.024*	
2624	IV/58	M	YA	8.7	2.9	-13.6±.024*	9.5±.033*	&
2625	X/3	F	YA	5.8	2.9	-14.6±.042	9.7±.027	@
2626	X/6	M	MA	15.8	2.8	-13.9±.005	10.3±.062	@
2627	X/7	M	YA	4.0	3.4	-17.2±.022*	9.4±.033*	@
2628	X/12	M	MA	7.2	2.9	-14.1±.071	9.2±.036	&
2629	X/16	F	YA	5.4	2.8	-14.2±.038	9.1±.027	
2630	X/20	M	MA	5.0	2.8	-14.6±.029	10.1±.018	
2631	X/25	M	YA	9.3	3.1	-14.6±.030	10.3±.021	&
2632	X/26	F	YA	5.7	3.1	-13.8±.069	9.3±.026	
2633	X/28	M	YA	4.4	3.0	-14.1±.061	10.0±.025	&
2634	X/32	M	MA	7.6	2.7	-13.0±.048	8.8±.026	&
2635	X/37	M	MA	9.3	2.7	-14.0±.035	10.1±.028	
2636	X/57	M	MA	5.1	2.9	-14.1±.037*	9.7±.025*	@
2637	X/64	M	YA	2.2	2.9	-13.8±.030	10.6±.023	&
2638	V/24	F	YA	4.3	2.6	-14.0±.040	8.7±.026	@
2639	IV/14	F	YA	5.1	2.8	n.a.	9.5±.019	



**Figure 1.** Plot of the stable isotope ratios of carbon and nitrogen in bone collagen from faunal and human skeletons. The human samples were collected at the early Iron Age site of Magdalenska gora in Slovenia, Yugoslavia. The faunal samples were recovered from the site of Altdorf in Bavaria. As discussed in the text these animals should be representative, both isotopically and in adaptation, of the fauna exploited by Iron Age inhabitants of Magdalenska gora. Note especially the relatively positive delta 13C values of the human samples as compared with the fauna. The faunal values reflect the "C3" environment expected in Europe. The human values represent an ingestion of approximately 60% "C4" based food. Two faunal samples (hare with delta 13C = -16.6o/oo and dog with delta 13C = -18.0o/oo) also have relatively positive carbon isotope ratios. In terms of nitrogen isotope ratios the human sample has delta 15N values that are, on average, about 4o/oo more positive than the fauna. The dog (at +9.3o/oo) falls within the human range. A single old aged male with extremely low carbon and nitrogen stable isotope ratios (delta 13C = -20.0o/oo, delta 15N = +5.4o/oo) clusters with the herbivores. Levels of precision: delta 13C =  $\pm 0.1$ , delta 15N =  $\pm 0.3$ .

Because marine foods in the diet can 'mimic' the ingestion of animal products as discussed above, it is important to consider their potential contribution to the diet at Magdalenska gora. The site lies along the Sava River over 80 kilometers inland from the Adriatic Sea. For this reason alone, it is unlikely that marine resources would have been available to the early Iron Age community. Anadromous fish, such as the large European sturgeon (*Acipenser sturio*), are the only possible exception to this. Sturgeon were once common in the Danube and its tributaries during the spring (Clark 1948; Grzimek 1973). Even so, remains of sturgeon have not been reported among the fish species recovered from Iron Age sites on the Danube (for example Gomolava, Clason 1979). Thus, it appears unlikely that sturgeon were an important component of the prehistoric diet.

The nitrogen isotope composition of freshwater regimes has not been studied sufficiently (Price et al. 1985), but the few data available (Schoeninger & DeNiro 1984) suggest that their isotopic signatures are similar to other terrestrial fauna. The carbon isotope evidence from

several studies in North America indicate that freshwater fish and mollusca may be characterized as "C3" food sources (van der Merwe & Vogel 1978; Bender et al. 1981; Chisholm & Nelson 1982). Perhaps more important for our study, though, is the recent analysis of faunal remains from the early Iron Age site of Most na Soči in Slovenia (Bartosiewicz 1985) which suggests that the swift rivers of the region were rarely exploited as food sources.

## Discussion: Diet

The relatively positive carbon stable isotope ratios of the human samples are surprising. Delta 13C values recorded for human samples from Europe have an average of -19.50/00 with a range from -17.20/00 to -24.60/00 (Burleigh et al. 1984) which reflects a diet based on "C3" foods, as expected. The Magdalenska gora humans have bone collagen stable carbon isotope ratios that are considerably more positive. Since marine and aquatic resources were probably not significant contributors to the diet, the high carbon values should be due either to the consumption of "C4" plants or of animals consuming "C4" plants. The faunal sample set (excluding the dog and the hare) has an average delta 13C value of -21.20/00 and a range from -19.60/00 to -21.90/00. These stable carbon isotope ratios show clearly that the animals were not feeding on "C4" plants. Since it is unlikely that dog and hare accounted for the major portion of human diet, the relatively positive delta 13C ratios of the humans are apparently due to a large proportion of "C4" plants in the vegetable diet. Broomcorn millet, *Panicum mileaceum*, is the only domesticated "C4" plant identified for Iron Age Europe. The less common Italian millet, *Setaria italica*, occurred probably only as a weed of cultivation (Renfrew 1973).

An approximation of the percentage of millet in the diet may be obtained by using a modification of the formula presented by Schwarcz et al. (1985).<sup>2</sup> For this purpose a delta 13C value for millet of -14.30/00 has been used (based on Bender 1968). The mean of the values published by Bender (1968) for the "C3" European domesticates, including wheats, barleys and oats, was used as the average for the "C3" plant contribution to the diet. This value (-27.60/00) is somewhat less positive than generalized values used in other studies (-26.50/00, van der Merwe & Vogel 1978; -26.00/00, Schwarcz et al. 1985). A fractionation, or enrichment, value of +50/00 between food and bone collagen of the consumer has been used based on van der Merwe & Vogel (1978). The average delta 13C value in the human sample (-14.70/00) from Magdalenska gora requires approximately 60% "C4" plants in the vegetable diet, with a range among the human samples from a low of 20% (delta 13C measured in bone collagen = -20.00/00) to a high of 72% (delta 13C = -13.00/00). These estimations appear to contradict the traditional interpretation that the two most important cereal crops in Iron Age Central Europe were wheat and barley (e.g. Barker 1985).

As a hardy, small grained cereal with a very short growing season and high tolerance for poor soils and little water (Renfrew 1973), millet was

2

$$\frac{(X - \text{delta } 13C - r)}{(\text{delta } 13C - \text{delta } 13C)}$$

Where X= the measured delta 13C value, delta 13C= the value of the "C3" diet, delta 13C= the value of the "C4" diet, and r= the fractionation value. We have substituted a negative sign in front of 'r', where r= +50/00 (contra Schwarcz et al. 1985, who use r= -50/00).

ideally suited to cultivation in central Europe as a spring crop (Barker 1985). The delta 13C values obtained in this study suggest that the productivity of this crop may have been great enough to make millet a staple crop for some communities. It is of interest to note that in the first century A.D., Pliny recorded that the Sarmatian tribes, who occupied what is now part of Poland and the Soviet Union, subsisted largely on a porridge made of millet (cited in Renfrew 1973). Similarly, the Greek geographer Strabo (63? B.C. - A.D. 21?) described the Iapodes of the rugged southeastern Alps as cultivators of spelt wheat and millet (Book VII, chapter V/4).

The clustering of the dog values with the humans is a phenomenon that has previously been noted for Northern Europe (Noe-Nygaard 1986) and South America (Burleigh & Brothwell 1978). This is certainly a result of the symbiotic relationship between humans and dog in that the "site-bound attachment of the dog" (Noe-Nygaard n.d.) led it to share in the human diet.

The hare exhibits the highest delta 13C value of the faunal complement, well within the human range, and suggests that a large proportion of the hare's diet consisted of "C4" plants. Barring the presence of as yet unidentified "C4" grasses in Europe, it is tempting to see this as the result of the hare's nocturnal forays into the community's millet fields in the spring and early summer, whereupon it was finally captured and added to the "menu" of the early Iron Age community.

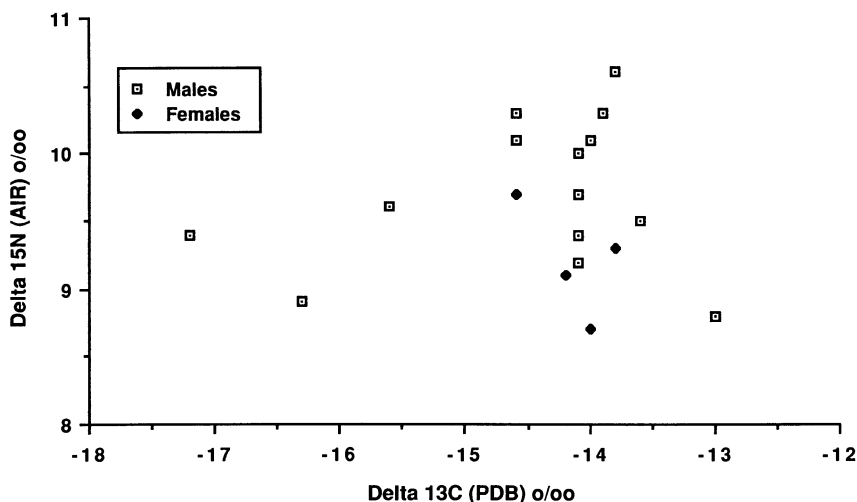
The anomalously low delta 13C (-20.00/00) and delta 15N (5.40/00) values of the individual from Tumulus IV, Grave 30, indicate that the old aged male's diet was similar to the Altdorf herbivores. On the basis of one individual it would be unwise to generalize about old age status and diet at Magdalenska gora. According to Angel (1968), the individual's teeth were in good condition and only moderately worn, so that dental health in this case should not have inhibited the intake of animal protein through meat consumption. It is more likely that the diet was related to certain cultural choices.

## Discussion: Status and Diet

For the consideration of status and diet, the delta 13C and delta 15N values of the Magdalenska gora sample are compared to several basic sample parameters to ascertain the presence of any patterns among the stable isotope ratios that could be indicative of status differentiation. These parameters are sex, age, presence or absence of weapons in the male burials, presence or absence of grave goods in all burials, and tumulus membership.

The most obvious pattern in Figure 2 is the smaller range of variation among females for both stable carbon and nitrogen isotope ratios than is observed for the sample of males. Although the apparent difference may be attributable to the small size of the female sample, the pattern suggests that females may have had a more restricted and homogenous diet. Furthermore, the ranges of the delta 15N values suggest that the consumption of animal products was more variable among men, with certain males of the community consuming more than any females. The most positive delta 15N value among the males is +10.60/00, a value nearly 10/00 more positive than the highest value among the females (+9.70/00). At the low end of the range, there is little difference; the least positive value in a male is +8.80/00 while that in a female is +8.70/00. The values in the male sample are more positive, on average, than those in the female sample (male  $\bar{x}$  = +9.70/00, excluding Tumulus IV, Grave 30; female  $\bar{x}$  = +9.30/00)



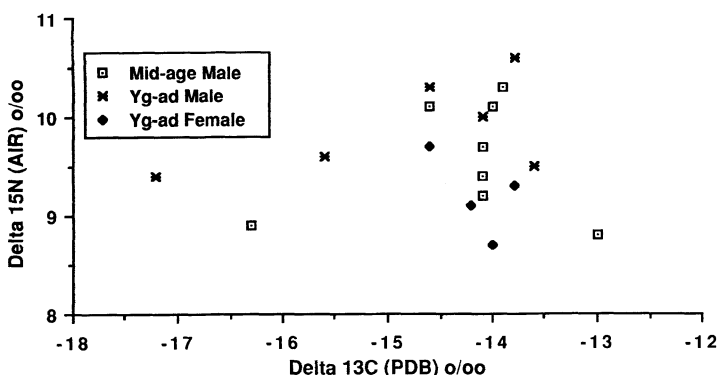


**Figure 2.** A comparison of bone collagen stable isotope ratios of carbon and nitrogen between males and females from Magdalenska gora. Note the group of six males who have more positive delta 15N values than any of the females. These values suggest greater ingestion of animal products on the part of these males relative to females. Furthermore, note the three males with relatively more negative delta 13C values signifying less "C4" foods in the diet than was true for most of the sample. The old aged male with anomalously low delta 13C (-20.0o/oo) and delta 15N (+5.4o/oo) values is not included in this graph. Levels of precision: delta 13C =  $\pm 0.1$ , delta 15N =  $\pm 0.3$ .

but these differences are not significant statistically ( $t = 1.33$ ,  $df = 17$ , not significant at  $p \leq .05$ ).

The difference in variability between males and females is even more extreme in the ranges of the delta 13C values. The range of stable carbon isotope ratios within the male sample, excluding the old aged male IV/30, is over 4o/oo (-17.5 to -13.0o/oo) whereas within the female sample it is less than 1o/oo (-14.6 to -13.8o/oo). It is interesting to note that the less positive delta 15N values (+8.7 to +9.7o/oo) among males are associated with the complete range of delta 13C values. Whereas the more positive delta 15N values (>+9.7 to +10.6o/oo) are associated with delta 13C values more positive than -14.7o/oo. These data suggest that those males who had access to more animal products (indicated by the more positive delta 15N values) also had more millet (indicated by the more positive delta 13C values). This is a difference of averages only, since there are males whose bone collagen delta 13C values are relatively positive, yet their delta 15N values are relatively negative. Among the female sample, the relatively positive delta 13C values (all above -14.7o/oo) are associated with less positive delta 15N values (all below +9.7o/oo). An explanation for this pattern is not obvious.

In Figure 3 the carbon and nitrogen stable isotope ratios are summarized by age and sex groups. All the females were young adults and for this reason determination of variability across age groups in the female sample is not possible. The single old aged male (delta 13C = -20.0o/oo; delta 15N = +5.4o/oo) is excluded from this graph. Among the other males there appears to be a pattern of less positive delta 13C and



**Figure 3.** A comparison of bone collagen stable carbon and nitrogen isotope ratios among groups defined by age and sex. Females (all young adults) fall in the lower end of the range of delta 15N values. There is some suggestion of a tendency toward more positive delta 15N values in young adult males (indicating more animal products in their diets) as compared with middle aged males. There is however considerable overlap, and the means are similar (young adult male  $\bar{x} = +9.9\text{o/oo}$ ; middle aged male  $\bar{x} = +9.6\text{o/oo}$ ). The old aged male with extremely low delta 13C ( $-20.0\text{o/oo}$ ) and delta 15N ( $+5.4\text{o/oo}$ ) values is not included in this graph. Levels of precision: delta 13C =  $\pm 0.1$ , delta 15N =  $\pm 0.3$ .

more positive delta 15N values for these young adult males relative to their middle aged seniors and the females.<sup>3</sup> While not significant statistically, the differences of the averages for the young adult and middle aged males appear to suggest the consumption of more animal products by the young adult males.<sup>4</sup> The old aged male apparently subsisted on a diet of grain and vegetables containing only a small percentage of "C4" plants.

For the remaining parameters, a comparison of carbon ratios fails to reveal any obvious patterns. Some males of both young adult and middle-age status were interred with weapons, including iron axes and spears, and in one instance a bronze helmet (Tumulus IV, Grave 3). A comparison of the nitrogen stable isotope values for "warriors" and "non-warriors" (Figure 4) indicates no significant differences between the two groups. Excluding the old aged male, IV/30, the respective delta 15N means are  $+9.6\text{o/oo}$  and  $+9.8\text{o/oo}$  ( $t = 0.65$ ,  $df = 12$ , not significant at  $p \leq .05$ ). The ranges of the values are also similar. This suggests that there were no diet distinctions between men interred with weapons and those buried without them. Among the "warriors" there is also no significant isotope difference correlating with weapon type or certain combinations of weapons.

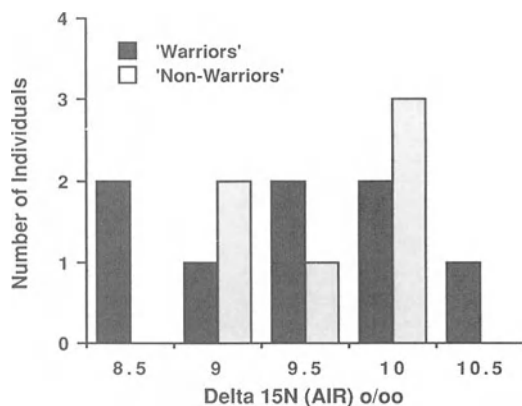
3

Delta 13C: Young adult male  $\bar{x} = -14.8\text{o/oo}$ ; middle-aged male  $\bar{x} = -14.3\text{o/oo}$ ; female  $\bar{x} = -14.2\text{o/oo}$ .

Delta 15N: Young adult male  $\bar{x} = +9.9\text{o/oo}$ ; middle-aged male  $\bar{x} = +9.6\text{o/oo}$ ; female  $\bar{x} = +9.3\text{o/oo}$ .

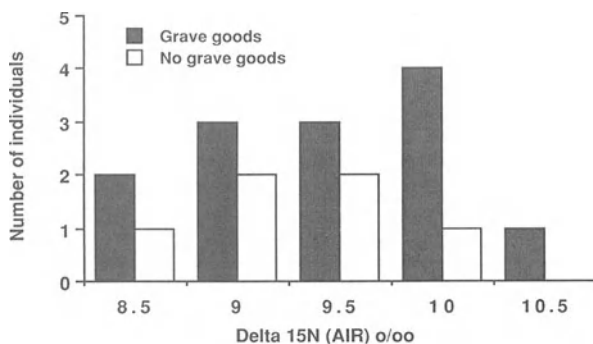
4

delta 13C:  $t = 0.83$ ,  $df = 12$ , not significant at  $p \leq .05$ ;  
delta 15N:  $t = 1.11$ ,  $df = 12$ , not significant at  $p \leq .05$ .



**Figure 4.** A plot of stable nitrogen isotope ratios in bone collagen from individuals identified as 'warriors' and 'non-warriors'. With the exception of the old aged male identified as a 'non-warrior' (not included in this graph, delta 15N= +5.4o/oo), there appears to be no difference between the two groups. Level of precision: delta 15N =  $\pm 0.3$ .

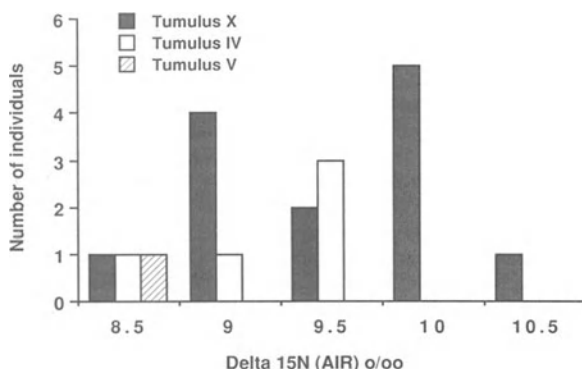
A similar pattern (or lack of pattern) is present in Figure 5, which presents a comparison of the nitrogen stable isotope values of those individuals interred with grave goods and those buried without. This figure includes individuals of both sexes and age groups. The average delta 15N values of the two groups, excluding the old aged male, are nearly identical at +9.6o/oo and +9.5o/oo respectively, as are the range of values ( $t = 0.38$ ,  $df = 17$ , not significant at  $p \leq .05$ ). Apparently there was no correlation between access to animal foods during the life of an individual and the placement of "wealth" in the form of burial goods upon that individual's death.



**Figure 5.** A plot of stable nitrogen isotope ratios in bone collagen from individuals buried with and without grave goods. With the exception of the old aged male who was buried with grave goods (not included in this graph, delta 15N = +5.4o/oo), there appears to be no difference between the two groups. Level of precision: delta 15N =  $\pm 0.3$ .

So far, in considering the entire sample from all tumuli, tentative distinctions in diet between the sexes and age groups have appeared while little correlation has been found between diet and material culture in the burials. When the sample is divided by tumulus membership in Figure 6 a different pattern appears. All of the individuals with delta 15N values that are more positive than +9.7‰ were recovered from Tumulus X. There is also evidence of greater variability in diet (evidenced by a larger range of variation in both carbon and nitrogen isotope values) in Tumulus X relative to Tumulus IV. The difference between the means from Tumulus X (delta 13C = -14.3‰, delta 15N = +9.7‰) versus Tumulus IV (delta 13C = -14.9‰, delta 15N = +9.4‰, not including the old aged male) is not significant statistically either for the delta 15N values ( $t = 1.03$ ,  $df = 16$ , not significant at  $p \leq .05$ ) or the delta 13C values ( $t = 1.05$ ,  $df = 15$ , not significant at  $p \leq .05$ ). Even so, the average delta 15N values differ in the direction suggesting less intake of animal protein on the part of members of Tumulus IV.

There are no significant differences in the material culture between the tumulus burials: all time periods, each sex, and each age group are represented as well as "warriors" and "non-warriors," and "wealthy" and "poor" graves. Yet there is some indication that the males of the clan or familial group identified with Tumulus X had preferred access to and consumption of animal products relative to the members of Tumulus IV. The results reported above show that this access cannot be correlated with differences in material culture or the inferred roles of individuals on the "inter-tumulus" or "intra-tumuli" level, nor is it explained by the distribution of females or of age groups in the tumuli. It may be tentatively explained by suggesting that, separate from aspects of material culture in mortuary contexts, mechanisms of social status differentiation were at work involving dietary restrictions or rules that served to separate members of different clan or family groups. Whether this involved the differences in family herd size, land on which to hunt, or preferential treatment during feasting is not clear.



**Figure 6.** A plot comparing the nitrogen stable isotope ratios in bone collagen of Magdalenska gora inhabitants who were interred in different tumuli. Note that none of the individuals from Tumulus IV have delta 15N values as positive as a large proportion of the individuals from Tumulus X. The old aged male with the extremely low delta 15N value (+5.4‰) from Tumulus IV is not included in this figure. Level of precision: delta 15N =  $\pm 0.3$ .

## Summary and Discussion

The stable carbon isotope ratios in bone collagen from the Magdalenska gora sample indicate the presence of a high percentage of "C4" plants, probably millet, in the vegetable diet of people living in Slovenia during the Hallstatt Iron Age. Whether this was a local adaptation or a characteristic of all central European communities awaits future studies of other populations. A more thorough knowledge of the isotopic compositions of plants in Europe is necessary in order to verify the place of millet as the solitary "C4" plant. As part of this on-going study, a selection of modern plants from central Europe has been sampled (S. Gregg, pers. comm.) and awaits analysis in the Bone Chemistry Laboratory at Harvard University.

The nitrogen isotope analyses indicate that there was no correlation between grave wealth or individual function and meat consumption. This could be seen to support Peter Wells' interpretation that there was little status differentiation among members of the community. However, the apparent difference in the consumption of animal products between two tumuli at Magdalenska gora suggests that the second aspect of this model, that there were no status differences between family groups, may not be accurate. It appears possible that status recognition, at least in terms of access to the products of the hunt or herd, may have been a function of family or clan membership.

The interpretations presented here are preliminary and tentative. A sample of 20 individuals from a cemetery that may have contained around 1800 burials (Wells 1981) is too small to provide more than suggestions for future investigation. Sample bias may result from the absence within our sample of any burials traditionally interpreted as those of individuals of the highest status based on object counts and diversity of grave goods.

Furthermore, the assumptions made in the use of Bavarian material to approximate the isotopic composition of the faunal component of the diet need to be tested by the analysis of Slovene faunal remains. In addition, the results of the nitrogen stable isotope analyses will be compared to the results from trace element analyses of the Magdalenska gora sample to test the estimations of meat consumption. Recent studies have shown the utility of the analysis of strontium and related trace elements in human mineral bone in the reconstruction of the meat component of the human diet (Schoeninger 1979a, 1979b, 1981; Blakely & Beck 1981; Peebles & Schoeninger 1981; Price & Kavanaugh 1982).

The method presented here is ideal for sites with excavated floral and faunal remains and associated burials; it stresses the need to appreciate the importance of the recovery of these food remains. There is promise in the integration of recent scientific advances with a program of museum and field work concerning the building of a research design to investigate the social organization of early Iron Age communities in particular, and of complex societies in general. This method could be applied in a diachronic perspective to skeletal collections in which the temporal and spatial patterns and burial contexts of a large number of graves are precisely known. The site of Mauenheim in Baden-Württemberg, West Germany, discussed in the paper by Bettina Arnold (this volume) would be an excellent focus for research. The approach will be complemented by future developments in the building of a body of middle range theory concerning the interpretation of mortuary practices.

It is hoped that the method presented here will provoke discussion and further interdisciplinary research into unlocking the information latent in museum and field collections that may illuminate the nature and development of complex society. To return again to the words of Graham Clark (1970:19):

The knowledge to be won by investigating the physical remains of early man far transcends the biological level....in sometimes unexpected ways it throws light on economic, social and even spiritual aspects of life.

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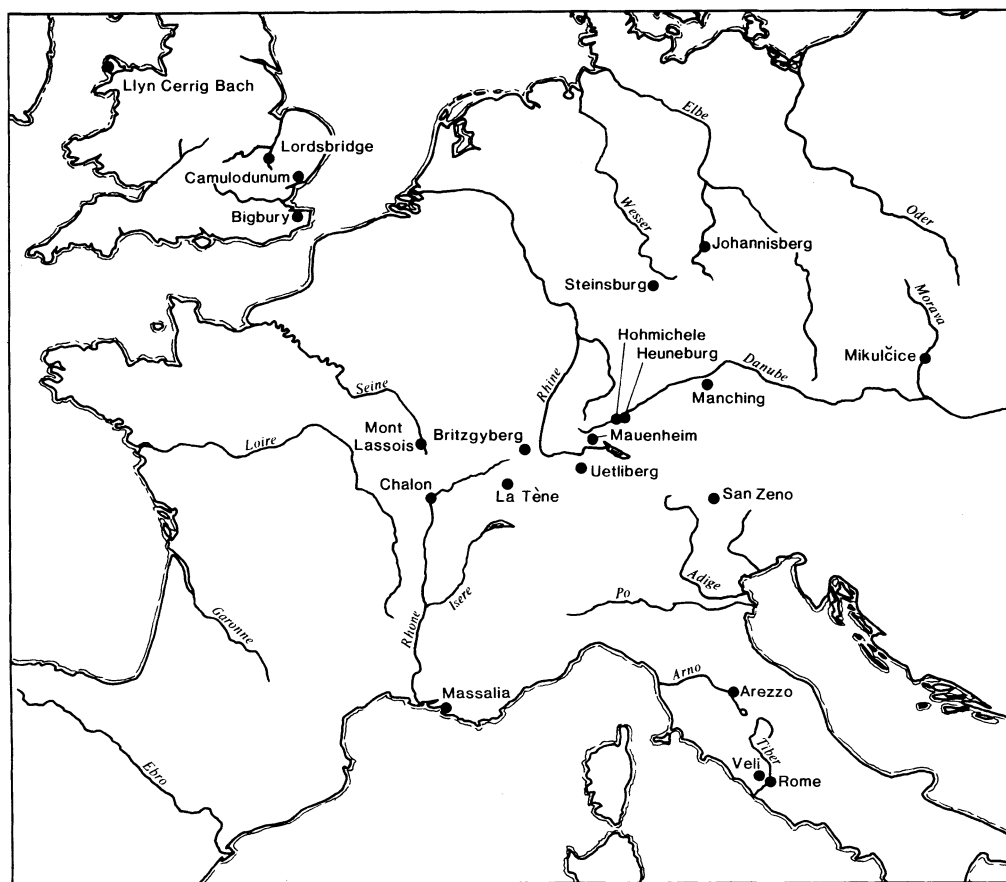
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## west central and southern europe



## SLAVERY IN LATE PREHISTORIC EUROPE:

### RECOVERING THE EVIDENCE FOR SOCIAL STRUCTURE IN IRON AGE SOCIETY

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There is a silent majority in Celtic society unrepresented in the tumulus cemeteries and merely implicit in the fortified settlements of the late Hallstatt and La Tène periods which tends to be glossed over or oversimplified in the archaeological literature. Most reconstructions of Celtic society make assumptions about the lower echelons that in fact have no firm investigative basis, but which are seminal to the arguments developed. I believe that an understanding of the nature of this group and its relation to the upper echelons is essential to any general reconstruction of Celtic society, and can no longer be avoided simply because of the difficulties inherent in its interpretation.

I should state at the outset that this is *not* a treatise attempting to prove the existence of an unfree stratum in Iron Age society. Neither is it yet another exercise in deconstructing other researchers' arguments without supplying anything to replace them. This paper began as a preliminary investigation into the phenomenon stated above, which seemed all-pervasive enough to be worth closer examination, and has developed into a constructive approach to the problem.

Two principal sources of information regarding the nature of a less-privileged or unfree population in the Iron Age of West Central Europe exist: 1) the archaeological and literary evidence for slave raiding and trading during the late Hallstatt and La Tène periods and 2) the archaeological and literary evidence for an indigenous less-privileged population during this time. I will discuss both issues and conclude by presenting some potential research directives suggested by related investigations in other parts of the world.

#### The Late Iron Age Evidence for Slave Raiding and Trading

Slave raiding and trading is generally assumed to have been an important aspect of late La Tène society. Nash (1985, 1978), Allen (1976), Peschel (1971) and others view the late La Tène as characterized by a brisk traffic in slaves, perishables, and raw materials in exchange for sought-after luxury imports from the Mediterranean. This school of thought views the oppida of the late La Tène as "defended refuges in a bellicose society" (Bintliff 1984:195), and emphasizes the role of the slave trade with Rome as an impetus for increased social complexity. Warfare produces

captives; and as Finley points out, "one of the few generalizations about the ancient world to which there is no exception is this, that the victorious power had absolute rights over the persons and property of the vanquished" (1959:152).

Iron gang-chains, shackles, locks, and keys have been found in many Late Iron Age contexts, although no compendium of these finds and their distribution has yet been made. Some well-known examples among many are the iron gang-chains from the Welsh peat bog of Llyn Cerrig Bach (Fox 1946), the Lordsbridge (Cambs.) gang-chain (ibid), and the gang-chains from Colchester (Essex) and Bigbury (Kent); the last three are probably associated with the cross-channel trade that Fox believed to have been controlled by the Belgae (1946:70). Iron foot shackles, two gang-chains and a handcuff are known from the site of Sanzeno in northern Italy (Nothdörfter 1979). Similar pieces were found at La Tène (Vouga 1923) and are known from the oppidum of Saône-sur-Chalon (Dechelette 1910), as well as Manching, and the Steinsburg oppidum in southern Thuringia (Peschel 1971:535).

A closer examination of the iron artifacts from excavated Late Iron Age oppida in Britain and the continent might indicate trade routes and possibly points of concentrated activity. At the very least a distribution map of such slave trade hardware presently in museum and university collections would provide some sense of how wide-spread a phenomenon such trade actually was.

### The Early Iron Age Evidence for Slave Raiding and Trading

A number of researchers have noted an important similarity between the late Hallstatt period and the late La Tène with regard to the exchange of human beings for luxury imports. Neither society, according to this school of thought, would have had much of real value to offer in exchange for Mediterranean elite goods other than their fellow human beings, at least at first (Grünert 1969:503; Nash 1985; Allen 1976; Champion 1985; Frankenstein & Rowlands 1978; Härke 1982; Gordon 1960; Kimmig 1983). Patterson points out that in general slaves constitute the earliest article of trade, especially of external and long-distance trade, between primitive societies and those more advanced (1982:148).

I am aware of the problems associated with using historical ethnographic examples to clarify or attempt an explanation of conditions in prehistoric Europe. I submit, however, that such sources of information, if approached with caution, can at least be used to define the parameters of the possible in a discussion such as this one. Eighteenth and 19th century West African trading relations with Europeans were comparable in some basic respects to the West Central Europe/Mediterranean interaction.

Meillasoux, for example, in his examination of West African trade, lists indigenous trade goods remarkably similar in kind to those cited for the late Hallstatt trade with the Mediterranean, with slaves constituting the principal export commodity (1971:52). It is interesting that slaves are invariably included in such export lists for this period, and yet not all those researchers who include them agree that there was in fact a trade in human beings with the Mediterranean cultures. It seems to me that some discussion of this phenomenon is necessary; trade in slaves requires specific social conditions which are not the same as those necessary for the export of forest products or other raw materials. There is an assumption of a slave trade being made repeatedly in the literature that has not been adequately substantiated by archaeological evidence.

One possible source of information regarding such an exchange in human beings is the Greek world itself. What was the extent of the Greek need for slave labor, and is there any evidence in the classical accounts for the Celtic world as a source of slaves? Finley discusses the extent of the demand for slaves in the Greek world, especially in agricultural production but also in the silver mines, processing mills and households of the very wealthy. At one point 30 thousand slaves are estimated to have been at work in the mines and mills of Attica, and the total slave population of Athens in the 5th and 4th centuries BC was around 80-100 thousand (1959:150). The number of Thracian slaves in the silver mines of Laurion in Xenophon's time (5th-4th centuries BC) was greater than the total population of some of the smaller Greek city states (ibid); the mines claimed thousands of barbarian lives every year due to the high mortality rate associated with the noxious work environment, so the demand would have remained constant. Nash points out that the Etruscan market for slaves was probably just as active, particularly due to the need for agricultural labor (1985:60).

The need was clearly great; the question is, was it necessary for the Greeks to go as far as West Central Europe to supply it? On this point the sources seem to respond in the negative; nowhere is the geographic region of the Keltoi named as the place of origin of regular supplies of Greek slaves. Thrace, Illyria, Scythia, Cappadocia are all mentioned, but they are closer to home and would have been logical sources of slave labor for Athens and the rest of Magna Graecia. If there had been trade in human beings taking place on the kind of scale suggested by some researchers, surely there would be some reference to it in the records at the receiving end?

Dissenting or cautious viewpoints to the Early Iron Age slave trade theory are presented by Bintliff (1984) and Peschel (1971). The latter has published the only in-depth discussion (with the exception of Nash's more recent study) of slave trade in the late Hallstatt period. Peschel feels that other exports (especially tin) would have been sufficient inducement for Mediterranean traders. He also argues that the capture and transport through hostile territory of untrained slaves who could not even speak Greek would have presented a risk too high for most traders to venture.

The assumption here is that Greek slavery was primarily of the domestic service variety. Finley (1959) and Vogt (1974) address this interpretation of Greek slavery in some detail. They demonstrate that the greatest need for slaves in Greece was in the fields, mines and processing mills, in decreasing order of economic importance, where speaking Greek would hardly have been a necessary accomplishment.

The argument regarding transport through enemy territory is addressed by Thompson in his discussion of the slave trade between the Germanic tribes and the Romans. "Such information as exists about the slave trade inside Germany itself shows the slaves being sold from one people to another until at last they were sold to the Romans on the Rhine" (1960:21). Nash sees the West Hallstatt chiefdoms as middlemen in just this sort of down-the-line trade in human beings, with its origins in what she terms "warrior societies" on the West Hallstatt peripheries. Trade in other commodities was of secondary importance to slaves. In her view, the Greek traders could have obtained food stuffs and raw materials such as tin from the Massalian hinterlands as well as Languedoc, Spain and Italy with far greater ease and less expense than from the Hallstatt chiefdoms (1985:53). To sum up, a late Hallstatt trade in slaves with the Mediterranean world would have been possible and was probably likely in spite of the absence of Greek written records corroborating such a scenario, but at present there is no direct evidence of its existence.



Härke sees indirect evidence for slave raiding in the settlement pattern of the late Hallstatt period. He states that...

"historical slave trading in Africa was based on an exchange of slaves for European prestige goods, and the increase in local conflicts through slave raids on the exploited peripheries led to an increasing need for military protection. This model could provide an explanation for the rapid increase in numbers of defended sites north and northwest of the West Hallstatt centers at a time when the latter were receiving considerable quantities of Mediterranean goods in the late 6th and early 5th centuries BC" (1982:201).

The many destruction levels at defended late Hallstatt hillforts like the Heuneburg bear witness to frequent and violent interactions between individual West Hallstatt centers as well; major conflagrations and wide-scale leveling of walls and structures followed by rebuilding phases are characteristic of many of these sites. That they were not all the result of industrial fires is attested to by the fact that the walls are usually found to have been reduced to ash and rubble. It would be interesting to see whether Härke's defended sites on the "exploited peripheries" display similar evidence of frequent violent destruction. If his model is correct, that is precisely the sort of evidence we would expect to find.

Warfare or simple kidnapping was not the only way a society like that of the West Hallstatt chiefdoms could obtain slaves for trade; Finley quotes Herodotus who describes the Thracians selling their children for export (1959:152). On the other hand, the theoretical works on slavery as an institution are unanimous on the point that selling members of one's tribe or kin group was associated with strong negative social sanctions, and it seems to have been rare in the history of slavery (Patterson 1982; Meillasoux 1971). Byrne, in his discussion of early Irish society, describes the type of in-group/out-group identity complex which might have made slave raiding socially acceptable in Hallstatt times as well:

"A person was an *aurrae* or *urrad* (citizen) in possession of his full legal rights only within the bounds of his own *tuath*; outside it he was a *deorad*, a stranger, exile, or even outlaw" (1971:133).

Such a restrictive system of membership would have provided the social sanctions for out-group slave raiding. The difficulty here lies in defining the geographic limits of the in- and out-groups archaeologically. Härke obviously sees the West Hallstatt centers as representative of an in-group which viewed the sites on the exploited peripheries as potential out-groups. The question is, what are the criteria used to define these groups, other than distance from one another and possibly slight variations in material culture? Is there really any way we can retroactively determine which centers were targets for raiding and which were considered socially unacceptable sources of prisoners for potential resale? It is extremely likely that these boundaries were fairly fluid and could include groups much closer to home under certain circumstances. This is dangerous ground for speculation; our knowledge of the West Hallstatt settlement pattern is not complete enough to allow for such detailed reconstructions of regional interaction.

### The Late Iron Age Evidence for Less Privileged Social Groups

The next issue under discussion is that of the existence in the late La Tène period of less privileged social divisions and the nature of the

relationship of such groups to the upper echelons described in the classical sources. Later pre-Roman Iron Age society is generally considered to have been one of very sharp social distinctions. Caesar describes the free warrior elite and the dependent peasantry and slaves without political voice as having a relationship that was either one of subordinate clientage or mere ownership. Although wealthy La Tène Celts had chattel slaves (mostly captives of war) the population was divided among a range of dependent statuses, from a semi-servile laborer or debt-bondsman who was virtually a slave, to members of the nobility (Bintliff 1984:203).

Caesar is of course a difficult source on this subject, largely due to his political interests in portraying Gaulish society as controlled by a warrior elite supported by a less privileged lower class. Nash acknowledges the role of coercion in late La Tène society in ensuring the provision of an adequate surplus for the maintenance of a non-producing warrior nobility as well as the juridical, religious, and artisan classes patronized by them (1978:470). The mass production of ceramic, metal and glass objects characteristic of pre-Roman late La Tène times required a source of exploitable manpower which served to widen and institutionalize the already existing class divisions (Peschel 1971).

Crumley goes into some detail on the evidence for complex indigenous Gaulish social structure before the Roman conquest in the Rhone corridor. She sees "clear archaeological evidence of an aristocracy, a middle class of merchants and skilled specialists who were guildsmen and a lower class composed of rural agriculturalists who used the centers as produce depots and the urban destitute who inhabited the centers' ghettos" (1974:256). Both the classical sources and the archaeological evidence of this period seem to corroborate the existence of less privileged groups of individuals, especially in the large urban centers; some of them seem to have been slaves in the strictest sense of the term, i.e. persons as property.

### **The Early Iron Age Evidence for Less Privileged Social Groups**

Defining the nature of the lower echelons in the late Hallstatt period presents a more complex problem. A number of scholars have noted the marked discrepancy between the population estimates based on admittedly scanty settlement evidence and those derived from the associated tumulus cemeteries.

Härke (1982:192) considers the total population of the Heuneburg, for example, to have been between 1500-2000 during the HaD1 peak period of the settlement. This figure contrasts markedly with Lorenz' observation that even the most generous population estimates for the Early Iron Age based on cemetery evidence render at most 30-40 people, including children, per settlement (1980:148). "Where", Lorenz asks, "were all those people buried who lived inside or just outside the walls of the *Fürstensitze* but did not belong to the nobility?" (ibid). He concludes that the cemeteries of these periods represent only the upper echelons, which in turn must mean that the rest of the population was disposed of in ways which are not easily detectable archaeologically (ibid).

This is certainly true of infants and prepubescent children, which are noticeably underrepresented in late Hallstatt cemeteries to an extent not adequately explained by the relatively poor preservation of such remains, compared with adult inhumations. Another obstacle is the extent of our ignorance regarding the number of secondary burials in individual tumuli. This would at least indicate the range of status differences within a given cemetery, and make it possible to determine the placement

within the social hierarchy of the relatively poorer graves, including those not found in tumuli. It is estimated that of the tumuli investigated during the last two centuries only 1% have been completely excavated; there is much to be learned from the reexcavation of these grave mounds.

Kimmig (1983:218) and Schiek (1981:136) also see the late Hallstatt tumuli as representative of a privileged upper stratum, and the discrepancy between the number of tumulus burials and the population estimates from the settlements are viewed as a problem. Even reducing Härke's rather generous estimate to the 100-200 individuals Wells (1984) estimates to have occupied the site at any one time presents a significant gap where there should be agreement. Of a given population of 200, only 40 individuals are being interred in a conspicuous manner. There must be some social significance to the fact that 80% of the population seems to have been interred or disposed of in ways different from the funeral rite practiced by the upper stratum. There is no doubt that if all the tumuli thought to be associated with the Heuneburg were excavated in their entirety, giving us the actual total including all secondary burials for a given point in time, the percentage of individuals not represented would drop appreciably. Until a late Hallstatt hillfort and its associated burial mounds are excavated to this extent, however, our hypotheses will continue to be constructed in the absence of any real data.

This becomes an important factor in most of the current reconstructions of late Hallstatt society, but unfortunately not one considered significant enough to be mentioned by most researchers. Wells, for example, assumes a reorganization of late Hallstatt society in response to the demand for surplus production on the part of the elite desirous of southern luxury imports (1985:83). According to this model, as the pressure to sustain the power structure created by the influx of luxury goods increased, the leaders of such a society "may have encouraged the members to produce more goods for trade with Greek merchants" (Wells 1985:85). We know, however, from studies like those by Barker that iron technology did not significantly transform the efficiency of agricultural production until late La Tène times (1985:157). Therefore, following Wells' model, increased production in the late Hallstatt period would also have required a restructuring of the lower echelons of society as the primary producers.

The two centuries under discussion (550-350 B.C.) do not represent sufficient time for an increase in population alone to have absorbed the presumably sudden increase in the demand for labor. Nash sees such political expansion as the "legitimate and illegitimate advancement of strong groups and individuals at the expense of the weaker members of their society and...the advancement of an entire society at the expense of its weaker neighbors" (1985:64). It is quite likely that as the distance between the direct recipients of the Mediterranean luxury imports and the individuals at the opposite end of the social spectrum increased, and the group known as Hallstatt *Fürsten* developed as distinct from the rest of the wealthier persons, the less privileged sector underwent some subdivision also.

It is impossible at present to state the precise nature of this lowest echelon, or to estimate the percentage of society represented; whether they were slaves in the strictest definition of the word is difficult to determine without more information. Baks et al. (1966) have examined this issue in some detail and come to the conclusion that slavery occurs only when the labor-seeking group is sufficiently powerful to impose a regime of continuous constraint on the group constituting the source of manpower.

This in turn is possible only in societies in which there is a system of stratification dividing the free members of the community into more than two hierarchic categories (1966:96). The definition of social stratification as a feature indicating a prevailing differentiation of status and authority congruent with the demand for manpower certainly applies to the late Hallstatt period, and most researchers would agree that there are subdivisions indicated in the upper strata as represented in the cemetery evidence. This simply means that the necessary conditions for the development of an unfree class as defined by Baks et al. (ibid) existed during the late Hallstatt period.

Other interpretations explaining the same phenomena are also possible, and have been presented by a number of researchers. One interpretation consists of a form of feudal clientship very similar to that described by Caesar for the late La Tène (e.g. Kimmig 1983; Zürn 1970). Another group, including Frankenstein and Rowlands, endorse a model which views clan heads as owners of the means of production establishing dominant positions, with poorer descent groups encouraged to direct their economic activity towards them rather than external trade partners (1978:77). The obvious observation which emerges from an overview of these interpretations is that the archaeological evidence as it has been presented to date is too fragmentary to allow for any definitive reconstructions of late Hallstatt society. At the same time, research directives can be derived from the questions generated by this inquiry which may eventually lead to some answers.

## Conclusions

The discrepancy between population estimates from settlement as compared to mortuary evidence at the expense of the less privileged social groups, whatever their precise nature, indicates an intentional overrepresentation of the upper echelons in burial ritual during the late Hallstatt period. It is clear that this type of institutionalized division could not have happened overnight, and fairly certain that the necessary ideological foundations were already in place before the first word of Greek goods or the Greek world penetrated the isolation of the West Hallstatt zone.

At the same time it is quite possible that contact with a more advanced and more highly stratified culture acted as a sort of catalyst, speeding up the process of increased social stratification thought by some to have its beginnings as early as the Bronze Age (Spindler 1983). The same precondition holds true for the slave trade theory; a socio-ideological construct recognizing the possibility of treating human beings as commodities under certain circumstances must have already existed prior to Greek contact.

Ideological sanctions could have created the link between this emphasis on the upper strata in death and their role in maintaining the general welfare of the society as a whole in life. Ancestor worship and the emergence of a priesthood, often congruent with the role of chieftain (Service 1971:162), seem to be reflected in the existing late Hallstatt evidence as a means of maintaining "the pervasive inequality of persons and groups in the society" (ibid:145).

Bittel's concept of a late Hallstatt/late La Tène ancestor cult as represented in the tumulus cemeteries and their frequent proximity to the cult areas, known as *Viereckschanzen* or *temene*, and thought to be primarily late La Tène in date, may provide a partial explanation of this mechanism. Ancestor worship is documented for many of the contemporary

cultures with a tumulus burial rite: Phrygians, Thracians, Lydians, Scythians and Etruscans (1981:88). Until we know more about the role of Viereckschanzen, and in particular whether or not they had late Hallstatt precursors, it will be difficult to draw conclusions regarding the ideological and the socio-political significance of the tumulus cemeteries and their connection with the late La Tène temene. The fact that such activity seems to begin in the late Hallstatt period, at the same time as so many other important changes, may have some significance for the discussion of the mechanisms by means of which the inhabitants of the Fürstensitze extracted the necessary surplus from their dependent peasantry.

Are any of these reconstructions, no matter how likely or theoretically sound, actually recognizable in the archaeological record, and if so, how? This is the point where most of the literature remains silent, and so frustrates further research. Is there information in the material already excavated which the right questions might reveal? Is there work done elsewhere which might offer valuable guidelines for more focussed fieldwork?

The archaeology of plantation slavery, particularly in the U.S. and the Caribbean, has been gradually amassing data in which artifact patterns representing social inequality can be identified within settlements. This approach has applications in the study of Iron Age social structure as well. Some researchers have tentatively put forward the theory that the unprotected outer settlement at the Heuneburg was the equivalent of a village for the less privileged members of society by virtue of its unprotected location and its physical separation from the acropolis area (Dehn 1958:140; van de Velde 1985:178). Considerable industrial activity was taking place there, as is evidenced by metal-working debris, a concentration of over 100 loom weights found within the vicinity of one structure, and other manufacturing by-products. Large quantities of ceramic and faunal material have been recovered from this outer settlement, indicating that people were actually living, and not just working, there (Schiek 1959:117-118; Kurz 1981, 1982; Sperber 1978, 1979).

It would be instructive to analyze and compare the artifact patterns from the outer settlement and the acropolis using an approach similar to the one presented by Lange and Handler in their analyses of faunal and ceramic material from slave plantation sites in Barbados and the U.S. They emphasize the correlation between vessel form and function and the information regarding the different subsistence activities that is provided by the style and variety of vessels from different parts of the plantations studied (1985:20).

Otto employs a similar technique in his analysis of the ceramic and faunal material from the Cannon's Point site in Georgia. He compares assemblages from refuse concentrations of slave cabins, overseers' cabins and the planter's kitchen, and concludes that the sizes and shapes of the vessels most commonly used correlate with diet, even to the extent that the sizes of faunal fragments correspond to the differences in diameter and shape of the cooking and eating vessels. The differences in diet create different patterns of ceramic shape and type from the different activity areas (1977:96).

Closer to the area and time periods under discussion in this paper is an excellent study done by Klaus Simon (1984) of material from several Thuringian hillforts of the Late Bronze Age and late Hallstatt periods. His investigations of the relationship between the acropolis area of defended sites like Alten Gleisberg and the associated settlements outside the walls, based on the analysis of ceramic material and other finds, have in fact produced evidence of a qualitative difference in the standard of

living enjoyed by the groups inhabiting these different areas. This significant difference extends to everyday ceramic material.

Simon examined the relative frequencies of late Urnfield/early Hallstatt coarseware from Alten Gleisberg, comparing the find inventory from the upper central plateau ridge to the southern terrace area. The categories used were a) relative date b) function c) quality (degree of decoration and fragmentation). His analysis produced significantly different results for the two contemporary settlement areas, particularly with regard to the percentage of decorated ceramic ware from the two samples (ibid:58).

Simon approaches an interpretation of these findings with commendable caution, but concludes that some sort of socially significant division is reflected in this physical separation of the population and the difference in the quality of life in the two areas as reflected in their pottery (ibid:59). He discusses other contemporary sites known to have similar settlement configurations and points out how little has been excavated of such extramural areas. Similar studies at sites like Alten Gleisberg could further augment the present findings and might very well clarify some of the questions regarding the nature of these less privileged groups and their relationship with the acropolis inhabitants.

Simon's analysis of ceramic material from the late Hallstatt phase of occupation on the Johannesberg near Jena-Lobeda, another Thuringian hill-fort, clearly shows that a considerably poorer quality ceramic (coarser temper, more poorly fired, and less decorated) was being produced and/or used in the settlement area outside the fortifications than in the protected interior (ibid:60). This is precisely the sort of analysis that could be applied profitably to West Hallstatt sites with identifiable suburbia, particularly the Heuneburg with its quantities of excavated material. There is evidence for extramural settlements at Mont Lassois, the Uetliberg, and the Britzgyberg in the West Hallstatt Zone, and a few other late Hallstatt sites in Thuringia besides the ones mentioned.

Ceramic material is not the only potential source of such information. Later European examples such as the Scythian royal seat of Kamenskoe gorodisce (Rolle 1980) and the early medieval fortified site of Mikulcice in Poland (Steuer 1982) show similar patterns of internal site divisions on the basis of rank and status as represented in the types and percentages of faunal material found in the acropolis as and the lower town areas. At Kamenskoe gorodisce, the high concentration of game animals such as deer and boar found on the acropolis were virtually absent in the assemblages from the lower town (Rolle 1980:139); this would seem to indicate a difference in both lifestyle and diet in the different settlement areas, probably the result of sumptuary rules such as those discussed by Service as characteristic of a chiefdom (1971:145). At Mikulcice the diet of the elite resident on the acropolis consisted to a large extent of suckling pig, a concentration not found in the lower town.

While more excavation of settlements, or even only of specific settlement areas, of the Hallstatt and La Tène periods would considerably simplify the inquiry, we can do something with what we have. If we postulate the existence of less privileged strata of society for the Iron Age in order to support a theory of increased production stimulated by contact with the Mediterranean, we must find a way to identify their presence in the archaeological record. If we deny such groups exist, we must produce more satisfactory models to explain the exact mechanisms of this "restructuring" of late Hallstatt society. Studies like those by Lange and Handler, Otto and especially Simon, which look at the internal organization of settlements, are a beginning.

The same holds true for the hypothesis of a slave trade in both the late Hallstatt and the late La Tène periods. Excavation of late La Tène oppida should focus a separate effort towards the identification and retrieval of physical evidence of slave trading, transport, and provisioning, and iron material already excavated should be examined for remains of slave trade hardware. This sort of evidence will certainly be more prevalent in the late La Tène material than in that from the late Hallstatt period, where iron probably would not have been wasted on gang-chains, handcuffs or other means of constraint. Wood and leather are the obvious organic substitutes, or precursors. In those rare cases where preservation is good enough for such material to have survived it may be possible to identify this kind of early evidence for the capture and transport of large numbers of human beings. Late Hallstatt settlements along the trade routes north of the Greek ports should be the object of particular study; one of these intermediary stop-off points may yet provide us with evidence for the stockpiling of human cargo.

At the moment there has not been enough fieldwork done to say unequivocally that traffic in slaves did not exist during the Iron Age, but whether or not the future holds the answer to this question, discussion of the topic should perhaps acknowledge the extent of our ignorance and not treat it as a given that slaves were routinely captured and sold to the Mediterranean cultures during the Iron Age of West Central Europe.

The cemetery evidence may very well yield more information on the subject of the silent majority of Iron Age society during the next few years. Relatively recent rescue excavations in Baden-Württemberg are filling in some of the blanks regarding the disposition of the less privileged dead. Excavation of a late Hallstatt tumulus cemetery of some 38 surviving mounds at Heidenheim-Schnaitheim revealed a second cemetery of approximately 30 extremely poor cremation graves in shallow pits or ceramic vessels 500 meters north of the tumulus cemetery. Biel feels these burials represent considerably poorer contemporaries of the wealthier individuals buried in the nearby tumuli (1977; also cited in Bittel et al. 1985:363). Trace element analysis of the bone from both the poor cremations and the wealthy inhumations might produce interesting results in spite of the acknowledged problems with the use of this technique in the study of diet and status (see Murray, this volume).

Aufdermauer's rescue excavations at the site of Mauenheim revealed a similar pattern: approximately 23 tumuli containing 98 graves, with 11 poorer flat graves between the contemporary tumuli were excavated (1962); these were only discovered because the entire area had to be cleared prior to construction. One such find might be termed a coincidence; two provide the beginning of a pattern. It is possible that the phenomenon described here, of poor flat graves or cremations in shallow pits and vessels between or beside tumuli containing wealthier burials, will turn out to be restricted to particular areas, and not characteristic of the West Hallstatt region as a whole. Nevertheless, future excavations of such cemeteries should routinely investigate the areas between tumuli as well as the territory beyond the mounds up to a certain distance. As in the case of the reexcavation of tumuli to recover the secondary burials missed in earlier excavations, it would be worthwhile to return to do the same at those cemeteries still accessible that were excavated under less than ideal circumstances through the centuries.

The most useful work of all would be the thorough investigation, through excavation and analysis, of a region like that likely to have been associated with the Heuneburg in late Hallstatt time. By this I mean determining the exact extent of the outer settlement, which has yet to be

done, followed by a study of ceramic and faunal material like Simon's, as well as the excavation of all the tumuli thought to belong to the hillfort in an attempt to get an accurate picture of the number of individuals represented in the population through time.

Excavation of the Viereckschanze associated with the Hohmichele and other tumuli, at least to determine the date of construction and possibly the connection between it and the cemetery, would be crucial to an understanding of the site. Also necessary would be the investigation of the terrace area below the hillfort on both sides of the Danube for traces (likely no longer well-preserved) of smaller supporting agricultural communities. While I realize that such a regional study would be the work of several lifetimes, without this kind of investigation research into the complex problem of Iron Age social structure will be condemned to a continuous series of glosses on past publications, and it will never be possible to answer questions about the existence of a slave trade or less privileged groups in either the late Hallstatt or late La Tène periods.

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## RISE OF COMPLEX SOCIETIES IN ITALY:

### HISTORICAL VERSUS ARCHAEOLOGICAL PERSPECTIVES

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In the Italian peninsula during the first millennium B.C., there existed at various periods complex cultural systems which achieved at their peak a proto-state or full state level of organization. One of these, the Greek city-state group of Sicily and southern Italy, was a colonial implant from the eastern Mediterranean which from the eighth century to the second century B.C. developed its own distinctive western Mediterranean characteristics (Boardman 1964). A second such complex cultural system was represented by the city-states of the Etruscans whose heartland was located just north of Rome. The Etruscans are now regarded by most archaeologists as a cultural group which evolved from Iron Age roots in the Italian peninsula, albeit with strong influence from the Greek world (Pallottino 1978; Torelli 1986).

Our understanding of the development of this Etruscan culture and society is based in part on written sources--Greek, Latin and to a limited degree Etruscan--and to a larger degree on archaeology. Etruscan archaeology has long concentrated on the socioeconomic elites, their possessions and their religious monuments (de Grummond 1986). The foundations for settlement archaeology of the Etruscans are just beginning to be laid and we are still woefully ignorant of their basic social and economic development (Potter 1979). The study of both the Etruscans and the Greek centers of Magna Graecia offers a great deal of data for scholars interested in the emergence of complex societies, but the consideration of these must remain beyond the scope of this short paper.

The most important and the most long lasting of these complex Italian cultural systems was that of Rome. Beginning as a small settlement of farmer-pastoralists along the Tiber, Rome passed from egalitarian village, to chiefdom and then on to become the most complex "world state" known in the west until the rise of imperial, capitalist powers in Europe and America in the late eighteenth and early nineteenth centuries (Scullard 1967; Ogilvie 1976; Hopkins 1978). In the fifth and sixth centuries A.D., this system collapsed down to a village and chiefdom society once again (Hodges & Whitehouse 1983). The process is well documented through a host of written texts, inscriptions and a full range of archaeological material. It is a long sequence of events that has fascinated historians and moralists since the Middle Ages, and has attracted the attention of some of the best historical minds since the work of Edward Gibbon in the eighteenth century (Gibbon 1854; Gooch 1959; Momigliano 1966).

Because of its close identity with our own cultural and historical experience, the study of Rome has remained the preserve of a special group of document-oriented scholars and has not received the type of distanced, objective "social science" consideration that it both deserves and needs. We assume that we know and understand Romans and their cultural processes, so familiar and well-illustrated does their history seem. The written texts are abundant and are in languages quite accessible to the student and scholar. They seem to speak of people and cultural forms that are very familiar and knowable. Moreover, their struggles and problems have become identified with our own so that a tendency emerges to see the Romans just as modern Europeans and Americans in bedsheets (Wills 1984). Archaeologists working with complex cultures where the written record is either nonexistent or exiguous, and the cultural forms exotic and unfamiliar, may regard the lot of Romanists as a blissful one.

However, as anthropologists who have dealt with a range of cultures well know, the superficial familiarity of a culture may deceive, leading to a tendency to gloss over major differences between "us" and "them." In the case of the Romans, the initial sense of familiarity provided by the written and visual forms, combined with the fact that the Romans are regarded as one of the prime sources of our civilization, has made us forget that we are dealing with a preindustrial culture separated from us by two millennia of time and historical experience, and several major cultural shifts both in socioeconomic forms and fundamental mentality (Veyne 1987). Therefore, we should approach the Roman experience as another example of the past as a "foreign country," and handle its written and artistic records with all the caution we would use with the material from an "other" culture (Lowenthal 1985). This means making the study of Rome more of an anthropological, and less of a traditionally historical discipline.

This perspective allows Rome to be considered more comfortably in relation to the other cultures and cultural processes which are the concern of this volume. It also permits and even encourages a much greater reliance on archaeological information. This is important because not only can the use of the full range of archaeological approaches provide important correctives to the written word, but it can also illuminate large areas of Roman social and economic life which were not considered at all, or considered only from a very distorted perspective by the elite members of Roman society who created and preserved the literary sources. However, it also requires a new type of classical-anthropological archaeology which sees the study of material culture and related subjects as something that can exist separately from the written sources, and which can also challenge the written information. Since classical archaeology evolved in large part as a response to the need to illustrate a vision of classical antiquity derived from literary and historical works, and has been linked, even chained to the philological method and the needs of the devotees of high culture up to the present day, this new perspective is only beginning to emerge (Dyson 1979, 1981, 1985). In fact, with the reassertion of a conservatism-elitism in cultural studies and post-modernism in art history, such developments may be aborted before they emerge fully born (Bloom 1987).

The issues discussed above relating to the source and perceptual problems inherent in considering Rome in anthropological perspective can be illustrated by a brief consideration of a very important problem in Roman history, one which is quite relevant to the theme of "Demography, Production and Exchange." This is the decline of the small Roman farmers, with the concomitant rise of large slave-manned estates during the second century B.C., and the failed effort of the tribune Tiberius Sempronius Gracchus in 133 B.C. to carry out major land reforms (Riddle 1970).

Rome, being a preindustrial society, was largely rural and agrarian. This fact is often forgotten due in part to the prominence of the surviving Roman urban archaeological remains today. Moreover, the Romans early adopted the historical myth of a close association between their cultural vigor and a society of farmer warriors. It is a cultural myth best represented by the farmer-leader Cincinnatus who left his plough to save Rome and returned thereafter to his agricultural pursuits. This is a myth which has special appeal in the United States where our own founding fathers identified easily with the early rustic Romans and which has contributed to a loss of perspective and objectivity in considering Roman history (Wills 1984).

According to the commonly accepted view of Roman history, the world of these peasant-warriors was fatally undermined during Rome's wars of conquest and the use of the spoils of conquest by wealthy Romans to evict the small farmers and create large slave-based estates (Toynbee 1965). Tiberius Gracchus is depicted as having perceived the dangers of this process and having made efforts to reverse the trend by proposals for land reform. He was destroyed by the conservative elite who regarded his proposals as dangerously revolutionary and threatening to their interests.

This is not the point to review all of the historical debates relating to Gracchus, land reform and the changing Roman countryside (for such a review, see Riddle 1970). What needs stressing is the degree to which the ancient literary record is flavored by contemporary and near contemporary political controversies, and the way in which modern historians have merged the Roman causes with their own, thus losing the distance and detachment of professional social scientists.

Ironically, the Gracchan controversy serves two very disparate approaches in modern historiography. One of these is moralistic and relates the decline of Rome to the emergence of luxury and greed during this opulent second century B.C. period. The other is Marxist and views the conflicts in terms of slavery and class struggle (Konstan 1975; de Ste. Croix 1981). What is often forgotten is that the ancient historical record will never provide us with a picture that is not biased or distorted. This is a reflection both of the heated controversies that surrounded and grew out of the events of the Gracchan period, and the lack of what we would regard as "hard data" in antiquity which could have been used for more objective judgments (Veyne 1984). However, a large quantity of potential data lies scattered throughout the fields of the Italian countryside, and it can be recovered and interpreted by survey and settlement archaeology.

Roman rural Italy is an ideal subject for archaeological survey. The Roman rural settlement pattern there was organized around independent farmsteads distributed throughout the countryside. Cities and towns were common, but the use of village settlement seems to have been limited (Potter 1987). Each farm site represents a core residential and productive unit. Size varied, but within much more limited ranges than probably would have been the case with more agglomerated settlements (Percival 1976). The Romans used quantities of heavy building material such as roof tiles in the construction of their farm buildings, and this makes the discovery of rural sites relatively easy. The Romans also produced an abundance of cheap consumer goods such as glazed pottery whose discarded remains litter almost any site, are found in great quantities and can be dated with considerable precision. It is therefore possible both to locate large numbers of rural sites and to arrange them on a time scale.

Several factors have limited the development of survey archaeology in Italy. One is the relatively recent introduction of mechanical agriculture

into most parts of the peninsula. While rural sites can be found in unploughed areas of the Mediterranean, the recovery rate increases enormously with mechanical cultivation. However, attitudinal factors among archaeologists and historians have possibly posed greater barriers to the development of a survey and settlement archaeology for the Roman world. History for the ancient historian has largely remained something recovered from written texts. These texts told us that the small farmers disappeared during the second century B.C. This must be a correct picture, since the Greeks and Romans told us so, even though many centuries and many prejudices may have separated them from an understanding of the events. The archaeologist had little inducement to search for what was not going to be there. Moreover, the duty of the classical archaeologist was to discover and explicate on objects relating to the true and the beautiful, and not to search for sherd scatters in hot and dusty fields. When the archaeologists did venture out into the countryside, especially before deep ploughing was introduced, what they generally saw were the massive remains of the few large villas that had survived above ground, and this only reinforced a sense of the correctness of the ancient authors. When this picture derived from the ancient sources was reinforced by such a trendy theoretical system as Marxism, the development of an independent archaeological approach seemed silly indeed (Dyson 1981a, 1981b, 1985).

Not all classical archaeologists shared this vision. Immediately after World War II, John Ward-Perkins, the director of the British School at Rome, began systematic exploration of the countryside around the Etruscan site of Veii (Ward-Perkins 1962, 1972; Potter 1979). This research, which has continued until the present, has allowed a reconstruction of changes in the Veiiian countryside before, during and after the Roman period. One of the most striking results has been the demonstration that the number of sites increased, not decreased, between the Gracchan period and the birth of Christ. The nature of these changes is still debated, but it is clear that the countryside around Veii did not undergo a simple linear evolution from small farms to large estates in the second and first centuries B.C. Ancient historians were slow to appreciate the importance of these results and still in many quarters today there is a reluctance to accept the significance of these data (Nagle 1979). The uneasiness is compounded by the fact that the Veii (and other) survey results question not only the ancient authors but also Marxist reconstructions of the course of Roman history. Historical materialists found themselves contradicted by the results of the studies of historical materials, and the conflict can cause considerable anguish (Carandini & Settis 1979).

The Veii surveys have been followed by other, similar research projects in other parts of Italy. At Cosa, a Roman colonial site on the west coast of Italy some 100 miles north of Rome, Wesleyan University surveyors found evidence for a well-populated second century B.C. landscape with only marginal declines in population before the second century B.C. (Dyson 1978). The Cosa data are of special interest to students of the Gracchan problem since Tiberius Gracchus is supposed to have derived his dim vision of the state of the Roman small farmer in part from his travels through that area. Other surveys in different regions of Italy show diverse patterns of development, but again no unilinear trend (Dyson 1982). Such local variation is not surprising in a region as geographically and historically varied as Italy. The overall impression is one of a well populated countryside with farmsteads with considerable ranges in size but with no domination by a few large estates.

This picture has important implications for questions of demography, production, trade and consumption. There is no need to comment to anthropological archaeologists about the problems of associating too

closely settlement change with demographic change. Roman Italy provides an interesting test case with both advantages and disadvantages. The written documentation does provide some information on plagues and other events that may have changed population levels. On the other hand, little has been done in the way of physical anthropology for the Roman period in Italy. Even though the Romans practiced inhumation from the second century A.D. onwards, only a handful of cemetery populations have been studied with any care. Again the reasons for this are complex, but one factor certainly has been the feeling that we know about the "physical" Romans from art and literature, and have little need for those skull measurements and detailed analyses of pelvic bones.

One area of potential demographic information that has been investigated shows us the gap between the Romans' notion of the presentation of information and our own. Roman tombstone inscriptions often provide very precise information on age at death. Early investigators of these epitaphs hoped that detailed statistical analysis of these abundant data would allow the creation of accurate Roman mortuary tables (Burns 1953).

However, comparison of the Roman data with those from modern third world countries with health conditions similar to ancient Rome revealed that the Roman patterns were very different from those modern countries studied by the UNESCO demographers (Hopkins 1966). This disparity suggested that what the Roman tombstone numbers represented was not objective data, but age information which commented on the significance of the death rate in relation to cultural values. While infants and middle-aged people were clearly underrepresented in the tombstone sample, those who achieved an extraordinary old age or who died in the first flower of youth were overrepresented. This information tells us much about Roman attitudes toward life and death, but little about statistical mortality. While this provides useful information for the cultural anthropologist, it sends the demographer back to survey archaeology and skeletal analysis (Hopkins 1983).

With all the limits of a demography based on a few surveys and almost no physical anthropology, it does seem possible to talk about a high population base in Italy in the period from the second century B.C. to the second century A.D. This population had a strong potential for considerable production, consumption and trade. It is impossible to tabulate directly the productivity and surpluses of Roman farms in Italy (White 1970; Evans 1980). However, several factors suggest that these farms did not all operate at the bare margins of existence. First of all, Roman Italy did not pay direct land taxes in the period under consideration, and is thus different from Egypt where a high percentage of the surplus went to the state (Lewis 1983). This residual income was available for purposes other than supporting the state. Secondly, Roman rural sites in Italy which have been investigated by either excavation or survey have yielded an abundance of material goods and physical amenities (Dyson 1985). On the architectural side these can range from simple cement floors and tile roofs to mosaics and wall paintings. Among the portable artifacts there are glass objects, lamps and a range of ceramic vessels.

These last objects bring us to the question of production, consumption and trade. One thing that impresses any archaeologist who studies the material culture of Rome is the abundance of objects available to quite ordinary Romans. One scholar who has worked at Pompeii and Herculaneum, where the eruption had preserved the total material goods of single households, observed that the Empire enjoyed a prosperity and range of possessions not enjoyed again until the nineteenth century (Packer 1975). I have in other contexts used the expression "consumer culture" to



describe aspects of the life style of Rome under the Empire and compared it with the emerging consumer world of eighteenth century England (Dyson 1985; McKendrick et al. 1982). Here also the danger presents itself that I will do what has been condemned in others and make the Romans seem more modern than they actually were. However, three developments in the Roman economy did make its economic system rather different from those of other preindustrial societies. They were the creation of mass production and mass marketing systems; the development of an efficient coinage; and the evolution of a complex local, regional and long-range marketing system.

The standardization and abundance of certain Roman products like pottery, lamps and glass is clear to any observer. The pottery industry has been studied in most detail because its products are essential for close archaeological dating (Peacock 1982; Pucci 1983). Under the Empire, two major types of luxury pottery circulated throughout the Empire. They were the *terra sigillata* or Arretine and the African red-glazed or slipped pottery. The production of the former was initially mainly centered in the north-central Italian city of Arrezzo, but then during the first century A.D. shifted into France. The products were highly standardized, a process aided by the extensive use of moulds. We know from accounting inscriptions as well as the totality of archaeological finds that production was enormous. For both socio-economic and technical reasons, the production base was still the relatively small workshop. With the second century A.D., the pottery markets in the Mediterranean became increasingly dominated by red-glazed pottery produced in North Africa and the quantities appear to have become even greater (Carandini 1983). Details on the way these products were marketed are limited, but we do know there were travelling merchants and periodic markets (MacMullen 1970). Clearly the marketing system was very complicated and sophisticated, since this import pottery penetrated into small Roman sites in the most isolated parts of Italy.

The glazed ceramic industry was possibly more centralized than other products because of the combined needs of abundant wool, special clays and skilled workmen. Other industries such as the production of lamps became more localized, although again the use of moulds allowed a highly standardized object. Even Roman cooking ware is distinctive for its quality and uniformity and range of forms and is clearly the creation of skilled potters and not just household artisans (Dyson 1976, 1983). Studies in the Roman provinces have shown that these ceramic types are marketed over considerable distances (Hodder 1974). Glass, which became increasingly abundant during the first centuries A.D., probably had similarly complex production and distribution system.

Money and markets also sustained this abundant trade in cheap, available goods. By the period of the Empire, the Romans had developed a flexible coinage system which combined the use of gold, silver and bronze issues (Mattingly 1960). This use of the lower denominations was especially important since it allowed the efficient exchange of non-prestige goods. The rural world of Roman Italy was built around a large number of central places which served as administrative, social and economic centers. These had not only periodic markets but also shops. We know from the Roman agricultural writers that certain areas had specialized products and that individual landowners were encouraged to diversify their products beyond the basic Mediterranean staples of wheat, wine and olives (White 1970). Most of the items found by survey and excavation would have been purchased and not produced in the household. Excavations where the full range of material culture found in even modest households have been published show that the residents possessed a great range and number of goods (Cotton 1979; Dyson 1983; Cotton & Metraux 1985). It should also not be forgotten that the archaeologist only finds a limited

range of the objects that were once used by any individual household. These are materials that are capable of surviving over long periods of time. Clearly, we are dealing with an economy where production of surplus for the acquisition of goods was important and where the level of prosperity was high enough to allow this to happen.

This trade in material goods has to be related to other distinctive aspects of Roman society, and this consideration will provide a distinctively anthropological note on which to end this paper. Another quality besides consumer abundance which characterized Roman society was a complex blend of localism and stability on the one hand, and cosmopolitanism and mobility on the other. Roman Italy was at the base an agrarian world made strongly local by a mountainous landscape and a lack of modern, fast transport. Most Romans during the period of the Empire probably passed their lives within a single, local community. However, these communities were bound together within one of the largest imperial systems created before the nineteenth century. Unity was enhanced within this deeply divided world by the employment of common political, cultural and symbolic forms. In talking about this Roman unity, stress is usually placed on the similar plans of cities and the uniformity in the style and message of the monuments (MacDonald 1986). Certainly these architectural and sculptural creations played a major role in creating a sense of belonging and commonality among the scattered settlements which formed the Roman Empire.

However, the more humble items of shared common material culture, such as *terra sigillata* with its classical scenes or the bronze coins and their messages of imperial good which would have been found on almost every table and at every market within Roman Italy, will also have enhanced this sense of belonging to a common social and cultural whole. Lamps, pots and coins formed a semiotic system for the humble folk of the Empire, contributing to their sense of "Romanness" as much as did the triumphal arches and the baths.

The society of Roman Italy under the Empire also manifested considerable mobility and economic instability in spite of the superficial impression of rustic stability. Status in Roman society was not automatically inherited and, while birth and wealth helped, they did not guarantee success for the members of a new generation (Hopkins 1978). This social and economic flux can be seen in the rapid turnovers in landholding in both city and country (Rawson 1976). Each town was the scene of a series of complex political, social and economic dramas as people competed for status, wealth and political honor while still trying to preserve some sense of community.

The group that best reflected this mobility was freed slaves, persons born or taken into servitude, who through talent, hard work and luck had earned not only their freedom but often considerable wealth (Duff 1928; Treggiari 1969; Garnsey 1970; Finley 1983). This rise was made possible not only by the flexible Roman legal system but also by the multiple opportunities that the complex Roman economy provided. As they achieved economic success, the most shrewd of the freedman stabilized their economic position by investing in land. However, their social and political options within the community were limited, since their status as former slaves barred them from the ruling elite. However, they could compensate for this and prepare the way for the social and political rise of their progeny by displays of both public munificence and private conspicuous consumption.

The first century A.D. Roman writer Petronius in his *Satyricon* has captured this mentality well in his brilliantly satirical portrait of

Trimalchio, a former slave grown rich by maritime commerce (Veyne 1961). Trimalchio is depicted as attempting to create personal economic stability by investment in land, and to enhance his social position and public image by displays of conspicuous consumption. The slightly absurd nature of this effort is made clear in the famous scene of Trimalchio's opulent banquet which is created by Petronius. There behind the vulgarity we can see a complex system of public display and status assertion made possible by the abundance of Roman material goods and the fluidity of its economy. Trimalchio is a distinctively Roman figure, but also one who can be viewed in a comparative archaeological perspective. He is on the one hand the equivalent of the Hallstatt chieftain and northwest coast tribal chieftain, but also the ancestor of the newly wealthy industrialists of nineteenth century America. He is an expression of the distinctive ways in which production and exchange moulded and were moulded by Roman society.

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## conclusions

## INDUSTRY AND SOCIETY IN LATE PREHISTORIC EUROPE

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My remarks will focus on one aspect of the theme of this volume, and that is production, specifically industrial, as opposed to subsistence production. The role of trade in the development of centers and the emergence of towns, cities, and civilization has been much discussed among American and British anthropological archaeologists, with reference to developments in both the Old and New Worlds. Production of goods for such trade was of course necessary to provide something to trade, yet the manufacturing side of the equation has received relatively little attention.

One reason why trade has received more attention is no doubt due to the fact that trade is readily identifiable archaeologically. If a community has engaged in trade, then trade goods - i.e. objects that originated elsewhere - are likely to be recovered on settlement sites, in graves, and in hoards or caches. The results of trade are often very apparent archaeologically.

Non-subsistence production, whether small-scale craft activity or large-scale industrial manufacturing, is less obvious in the archaeological record and, once identified, is more complex to interpret. Good evidence for industrial activity is likely to appear only on settlement sites, not often in graves or in hoards. Manufacturing is frequently concentrated in one part of a settlement, thus partial excavations will not necessarily uncover information about this activity. Finally, even once a pottery kiln or bronze foundry has been discovered, the scale of manufacturing and the organization of the activity are not easy to determine.

Production and exchange are interrelated. Without production, there can be no exchange. Most arguments relating the development of cultural complexity to growth of trade systems refer to trade in raw materials and luxury products, not in subsistence goods. Thus in order to understand how economic development affects the growth of social complexity, we need to arrive at better understanding of manufacturing processes and the organization of those activities. It is interesting that none of the authors of the papers in this volume chose to focus on the theme of production beyond subsistence, despite the subtitle of the book. Arnold, Dyson, and Geselowitz all address the topic along with other related subjects, and the other papers suggest implications for the issue.



The questions I wish to pose are; 1) how was industrial production organized during late prehistoric and early historic times in Europe, 2) what changes were taking place in manufacturing activity, and 3) what impact did those changes have on the societies involved? To answer these questions, we need to examine specific cases from different times and places in order to develop the information necessary to generalize and to identify trends through time.

Arnold's paper on slavery has many implications for study of industrial production. One question she does not address is, if there were "slaves" in Early Iron Age Europe, what exactly were they used for? Our general notion of slavery involves the use of unfree human beings to perform specific tasks. As she notes, in Greece at this time slaves were used in the mines. Might slaves have been used in mines in temperate Europe as well?

In the site of Hallstatt we have the opportunity to test all kinds of interesting questions about production, trade, and social structure in the Early Iron Age (Kromer 1959; Wells 1981). If slavery existed in central Europe, would not the salt mines of Hallstatt be one place where we would expect some of them to have been employed? Yet there is no evidence of slavery at the site, either in the cemetery or in the galleries of the mines. As a number of observers have noted, the Hallstatt cemetery is, on average, the richest of the period in temperate Europe, yet the disparity in grave wealth between graves is relatively slight. There are no so-called "princely tombs" (*Fürstengräber*), and no poor ones. The size and chronological range of the known cemetery suggests a population at Hallstatt of some 200 or 300 persons. It is unlikely that so many non-essential people would have chosen to live in the cold and damp Alpine valley at Hallstatt if a class of slaves was doing the actual mining work.

That many managers and supervisors could not have been required to oversee the operation. We know from the size of the galleries that only a very small team of miners could have worked at the rock-salt face of each tunnel, hence the majority of the workers must have been support personnel, carrying salt out of the mines, felling trees, building timber walkways, and so on (Schauberger 1960). The slightly later evidence at the salt mines on the Dürrnberg, just 30 kilometers to the west, also argues against the existence of slaves working the mines. Physical anthropological study of the skeletal remains there has shown that the people in the well-outfitted burials had done very strenuous work during their lives (Schultz 1978). In other words, they seem to have been the miners.

Arnold cites Peschel on the idea that European slaves may have been employed in mass production industries for pottery, metal goods, and glass. Yet for the *Early* Iron Age, we cannot speak of mass production. Even at the manufacturing centers of the period, of which the Heuneburg is the best-studied example, there is no indication of production on a scale greater than that of small workshops (Kimmig 1975). It is certainly possible that unfree laborers assisted master craftsmen in making fine pottery, bronze fibulae, and jet bracelets, but the numbers of individuals involved would have been so small that we could hardly speak of a "class" of unfree individuals. We could get a much better handle on this question if we had more actual production sites from this period. Scattered manufacturing debris informs us that the Heuneburg and the other centers like it were locations where manufacturing in a number of different materials took place, but as yet we have no good idea of the scale of that production.

Geselowitz's paper deals largely with the same time period, but his concern is more with technology and attitude. His research is illuminating

the level of technological ability and awareness in iron production at the beginning of the Iron Age. His approach is important in showing the role played by cultural factors that are not technological, and may not even be what we consider "economic," in determining the character and level of industrial production. Looked at from a purely technological perspective, it would be difficult to understand why, when iron metallurgy was developed by around 1000 B.C., it took several centuries before European communities shifted from a bronze-based to an iron-based tool technology. This paper points up an issue requiring much more investigation - the relation between innovation and industrial organization; specifically, why, when a new technology has obvious economic advantages (from our modern point of view, at least), was it not rapidly adopted.

Dyson's paper is particularly pertinent to the concerns of our discipline today with respect to understanding change in the past. During the Roman period, industrial products were being manufactured and distributed on a mass scale very different from any earlier system in Europe. A large number of people were involved in both manufacturing and circulation. Even if individual factories may have been modest in size, the total output of *terra sigillata* pottery was enormous. Like other mass-marketed goods, such as Attic pottery in the sixth and fifth centuries B.C. and Levi's jeans in the 1970s and 1980s, an extraordinary uniformity of demand existed for this particular product. Everybody wanted it. The existence of such products and the enormous cross-cultural demand for them meant that individuals in many different places are willing to work harder and exchange more value to acquire the particular standardized good. As Dyson rightly points out, there are important implications for the culture of the consumers of such mass-produced wares. Just as the wearing of Levi's in the 1970s provided people of different social classes in different regions of North America and in numerous countries abroad with a feeling of belonging to a great shared set of cultural values, so too the mass consumption of *terra sigillata* pottery must have provided a similar sense of cultural "belonging." In such cases, the scale and level of production plays an important role in cultural integration, providing huge numbers of culturally distinct people with a sign of their affiliation.

Although manufacturing does not play a major role in Gibson's paper, he notes that one important distinction between what he calls "aristocratic households" and others is the presence on those sites of craft products of all classes and, on some of the sites, of workshops where "elite" goods were produced. Gibson does not, unfortunately, tell us what the crafts products are. In order to judge the cultural significance of these materials, it would be necessary know the exact nature of the products, the places of origin of the raw materials, the scale of production, and their wider distribution in the social landscape. This kind of information could be very important to his model and his argument.

Ostoja-Zagórski makes observations related to Geselowitz's theme. Despite the development of iron metallurgy during the cultural florescence of Hallstatt phase D2 (520-500 B.C.), he notes the lack of application of this new technology to agriculture. A crisis during the third century before Christ came to an end, he suggests, when new advances were made in agricultural technology, including the development of new iron tools. If the technology of iron production was known earlier, why was it not applied where it was needed - to food production? This paper provides another good illustration of complicating cultural factors preventing what we would regard as the most efficient application of a new technology. Ostoja-Zagórski's paper suggests that an important inter-relation exists between industrial production and the growth of societal complexity. The manufacture of new iron tools helped relieve the economic

crisis of the third century B.C., and other new iron implements enabled more innovations in agricultural production in the Middle Ages.

Using these papers as a point of departure, I should like to suggest some new perspectives on the relationship between industry and society in late prehistoric Europe. The European data base is rich, and we can ask of it a variety of interesting questions about manufacturing, commerce, and society.

## Background

For the Neolithic period (roughly 5000-2000 B.C. in temperate Europe) and most of the Bronze Age (2000-1200 B.C.), the evidence suggests that very little manufacturing activity was carried out to produce goods for consumption by persons other than members of the immediate community. Industry, or craft activity, was done within the context of the community for that community. Each hamlet or village produced what its own members needed in food, clothing, shelter, personal ornaments, tools, and weapons. Some trade was always carried on by many, or most, communities, but the objects traded were raw materials rather than manufactured goods.

During the Neolithic Period certain favored types of stone were traded, as well as other desirable items such as amber from the Baltic shores and *spondylus* shells from the Mediterranean. During the Bronze Age copper and tin were added to the repertoire of regularly-traded materials, and the wide distribution of bronze objects recovered in cemeteries and on settlements throughout Europe attests to the extensiveness of the trade in metal. Yet aside from the mining sites where the metals were extracted and processed (Pittioni 1976), there is no evidence for the existence of production centers where bronze objects were manufactured for consumption by other communities. Both traces of manufacturing, such as molds and bronze droplets, and distributions of particular types of objects instead point to local manufacture for local needs.

During the Late Bronze Age, 1200-800 B.C., some important changes took place in the organization of manufacturing. Most materials continued to be produced on the local level, but there is good evidence for the beginning of centralized manufacturing of goods for distribution well beyond community boundaries. During the Late Bronze Age mining and smelting of copper and tin, and trade in bronze expanded greatly, and the quantities of bronze metal in use for jewelry, ornaments, tools, and weapons were vastly greater than during any earlier time (Müller-Karpe 1959). With the increased trade activity required to transport the bronze metal from sources to consumers, commercial systems in other goods also grew rapidly, bringing glass beads, gold, and graphite to communities throughout central Europe.

Distributions of a number of different kinds of products in this period indicate that they were being made at specific centers for dissemination over wide areas. These objects include the slashing swords characteristic of the period (Schauer 1971), ornate bronze vessels of different forms (von Merhart 1952), and small blue glass beads (Haevernich 1978). Unfortunately we do not yet have any good evidence for the workshops in which such special items were being manufactured, and thus have only the distribution patterns to work with. Most of the objects in the material culture of the period were still produced on a local level for home consumption, as we know from hundreds of finds of molds and partly-made objects at the typical hamlet-size farming settlements.

## Manufacturing Centers of the Early Iron Age

Manufacturing and other industrial activity played a very different and much more significant role in Early Iron Age society than at any earlier time in temperate Europe. At the salt-mining site of Hallstatt in Austria, about which Arnold commented in her paper, a substantial mining and trading town developed after 800 B.C., with a population of some 300 persons extracting and trading salt. In its situation high in an Alpine valley well-removed from the typical farming communities of its time, Hallstatt is comparable in some respects to the copper and tin mining communities of the Bronze Age, but it was larger by a factor of at least 10. Furthermore, the roughly 2500 graves that have been excavated at Hallstatt show that the community became a commercial center of continental proportions and that considerable wealth was accumulated through the salt enterprise.

Changes in the importance of manufacturing in society are most apparent at a series of new industrially- and commercially-based communities located in the fertile and populated regions north of the Alps. The Heuneburg on the upper Danube River in southern Württemberg is the best known of these communities because it has been under intensive excavation since 1951. We know of a number of other communities that appear to have been very similar in character to the Heuneburg, and the more research is carried out, the more widespread this phenomenon of Early Iron Age industrial towns appears to have been. Other sites of the Heuneburg type include Mont Lassois, the Britzgyberg, and Château-sur-Salins in eastern France, Châtillon-sur-Glâne in Switzerland, the Hohenasperg in Württemberg, Závist in Bohemia, and the Hellbrunnerberg in Austria. Earlier studies of these sites in Early Iron Age Europe have focused principally on the commercial aspect of these centers, in particular their trade with Mediterranean peoples as evidenced by Greek pottery, wine amphorae, and bronze vessels. These Early Iron Age towns were important industrial centers as well, and I shall focus on that aspect here. The Heuneburg will serve as an example of the group, since it has been the most thoroughly studied.

Among the industrial activities represented at the Heuneburg are manufacturing of pottery, bronze jewelry, sheet bronze objects, lignite and jet jewelry, and coral ornaments (Kimmig 1983). Gold ring jewelry, including the sheet gold neckrings characteristic of the rich Hallstatt D graves, and ornate daggers of the same phase were almost certainly made in workshops at the Heuneburg as well, although traces of those fine craft activities have not yet come to light in the excavations. In order to understand the importance of these industries for the society of central Europe between 600 and 450 B.C., we need to look closely at the nature of the goods manufactured and at their distribution, both geographical and social.

The industries that are best represented in the archaeological evidence at the Heuneburg were producing objects of primarily social significance, not items of principally technological importance such as tools and weapons. Evidence for the manufacture of such technological implements is much less common in the archaeological record, and indeed, tools and weapons are much rarer in all contexts - settlement deposits and graves - than items of jewelry and ornamentation.

The manufacture of jewelry is particularly well represented at the Heuneburg, by such finds as molds for casting finger rings (Bittel & Rieth 1957) and bracelets (Schiek 1959), partly-made but discarded fibulae (Mansfeld 1973), workshop debris for the production of rings from jet and

lignite, and remains from the carving of coral for use as inlay in bronze jewelry (Kimmig 1971).

Studies of the distribution of objects made in the workshops at the Heuneburg show a broad dissemination of the products to communities throughout the countryside (e.g. Mansfeld 1973). Dämmer's analysis (1978) of the fine painted pottery from the Heuneburg shows a similar kind of distribution from the production center out into communities both nearby and further removed from the site of manufacture. The archaeological evidence of the distribution of products manufactured at the Heuneburg in cemeteries and on settlements throughout southwest Germany suggests substantial and regular production of goods at the industrial center for consumers living outside it (Wells 1987).

The significance of these industries in Early Iron Age society becomes more apparent if we consider the meaning of these manufactured goods to the people who acquired and used them. As a number of anthropologists (e.g. Douglas & Isherwood 1979; Appadurai 1986) have recently argued, manufactured goods can be understood in their role as signs or symbols; used for communicating a wide range of kinds of information within a community. This aspect of the use of goods is particularly clear in the case of jewelry. Petr Bogatyrev, for example, has explicated some of the kinds of information that jewelry and other forms of personal ornament is used to convey (1971). Ludwig Pauli has successfully applied some of these ideas to analysis of patterns of jewelry use in Early Iron Age Württemberg (1972).

If a major role, or perhaps the principal role, of the Early Iron Age towns was the manufacture of material signs for central European communities, why did this new town-based industrial system first develop at this particular time? The profound cultural changes that took place between the Bronze Age and the Iron Age (Peroni 1979) included, or necessitated, changes in the relationships between persons and the objects they used as signs. As I have argued elsewhere (1985), this transition marked a fundamental transformation in European society from a system organized around small, family-based communities to one in which larger and more cosmopolitan communities played an ever-increasing role.

One change that is clearly represented in the archaeological record, though not yet well understood, was a change from the representation of the person in his or her position as a member of the larger community in the Late Bronze Age, to representation of the person as a distinct individual in the Early Iron Age. This shift is reflected in the burial practices. In the Late Bronze Age, the cremated remains of the individual were buried usually within a ceramic urn with few grave goods in a small grave pit without a tumulus. As far as we know, nothing above the ground marked the grave. In the Early Iron Age, each individual was buried beneath a separate mound. Grave equipment varied considerably more than in the preceding period, and size and complexity of the mound also differed for different individuals.

The same shift from material expression of commonality to expression of individuality is apparent in personal ornaments. Late Bronze Age fibulae, for example, were highly standardized and showed little ornamental variation. Early Iron Age fibulae show great variation and each object was unique. The sheet bronze belt plates of the Late Bronze and Early Iron Ages reflect this pattern even more clearly (Kilian-Dirlmeier 1972). Late Bronze Age belt plates are only sparsely decorated and are often very similar to one another. Those made during the Early Iron Age are highly decorated, and each belt plate has its own distinctive pattern of ornamentation.

The centuries around 1000 B.C. were times of profound culture change (Peroni 1979). Trade systems were expanding rapidly, and central Europeans were coming into regular contact with Mediterranean peoples. Organized violence, both offensive and defensive, was increasing throughout Europe to judge by the proliferation of hilltop fortifications and of weaponry. Wealth was being generated and accumulated in quantities much larger than before, and changes in social structure were taking place. The formation of the first towns of temperate Europe, such as the Heuneburg, was part of the result of this cultural turmoil.

These myriad changes in economic and social patterns brought new needs for expression by central Europeans to deal with the cultural realignments. Community size increased during these times, as did interaction between individuals from different communities. Items of jewelry and other kinds of personal ornament that served to communicate information about an individual's status and position in a small farming community (Bogatyrev 1971) required modification for use as signs in larger, more complex social configurations. The new industries that developed at the Heuneburg and other sites of its type responded to this need for new and more elaborate sets of material symbols. In this sense, these new industrial towns functioned primarily to produce the material paraphernalia needed by persons in the cultural system to cope with the changes taking place in society.

Personal objects serve to do more than just signify the person's status and position in traditional societies. They also communicate information about a person's values and ideals and provide their users with visible symbolic devices to construct meaningful worlds (Douglas & Isherwood 1979:5). In a society undergoing rapid change, goods play an especially important role in providing people with means to define and represent their positions within the changing order (ibid:95). In a context such as the Early Iron Age, when profound cultural changes were taking place at a rapid rate, new material objects to symbolize status and position were much needed. Thus, the demand for the products of the Heuneburg workshops was great, not only among the newly-urban population of the towns, but also among the equally affected hinterland communities.

The Early Iron Age manufacturing and trading towns such as the Heuneburg declined in activity during the latter half of the fourth century before Christ, in large part because of disruptions in long-distance commercial systems (Wells 1984). Between the mid-fifth century before Christ and about 150 B.C., we have no evidence for centralized manufacturing activity such as that at the Heuneburg. Objects of personal ornament made during those three centuries were highly decorated and at least as individualized in character as the jewelry made at the Early Iron Age towns. The bronze neck-rings, bracelets, and fibulae placed in the graves of women during this time were individually made and unique (Jacobsthal 1944), and even the swords, scabbards, and spearheads buried with men frequently bore distinctive ornamentation (de Navarro 1972). Yet these objects were apparently manufactured in small, dispersed workshops instead of in industrial centers (Megaw 1985). Thus the importance of individual decoration on objects for the transmission of information about persons apparently did not decrease, even while the organization of production of those objects changed greatly.

### Industry at the Late Iron Age Oppida

In some respects, the patterns of manufacturing at the oppida are similar to those at the Early Iron Age centers, but there are important differences. Manching serves as the best example of the oppida because it

has been the most extensively investigated, but many other sites have been substantially researched as well and they show patterns similar to those at Manching (Collis 1984). As at the Heuneburg and the other Early Iron Age centers, the oppidum workshops produced large quantities of personal ornaments and decorative objects. These included fibulae (principally of bronze but also of iron), bronze bracelets, glass beads and bracelets; and a variety of bronze pendants and attachments. Among the several different categories of ceramics that are well represented on the oppidum settlements is a thin-walled, fine polychrome painted ware apparently intended as a "show" ware much like the fine polychrome pottery at the Heuneburg. Just as in the case of the Early Iron Age manufacturing centers, here too the products from the oppida were widely disseminated into the countryside where they are recovered in the small settlements. Recent excavations at the sites of Altendorf (Stöckli 1979) and Berching-Pollanten (Fischer et al. 1984) in Bavaria have yielded good material evidence for such interactions between the smaller communities and the industries centered at the oppida.

But the workshops at the oppida were not manufacturing only objects for use as personal ornaments. Rather, large-scale industries in iron and steel developed at these centers and produced great quantities of tools intended for a wide range of economic purposes. During the second century before Christ, for the first time in temperate Europe, iron-working was carried out to such an extent that the metal became truly common in the material culture (Pleiner 1980). We can speak of an industrial revolution in metal production during this century, resulting in vastly more iron tools in everyday use and the development of many new kinds of tools. The new metal industries brought about changes not only in technological and manufacturing facets of society, but in the entire way of life of Europeans.

The industries produced tools in mass series, as we see from the finds from Manching (Jacobi 1974). Large numbers of knives, axes, clamps, and other implements have been recovered and studied there, all very similar in character and apparently turned out in large runs, not as individually-crafted pieces. The efficiency and organization of food production were directly affected by the new industries, as iron plowshares came into use for the first time, along with colters, scythes, and iron-tipped shovels. All of these tools made the tilling of the soil much easier, enabling fewer farmers to produce food for larger numbers of non-farming members of the communities.

A wide range of crafts activities were also affected by the expansion of the iron industry. In his study of the iron from Manching, Jacobi (ibid) documents the development of new tools for metal-working, carpentry, leather and textile processing, pottery manufacture, agriculture, fishing, commerce (fine balances), toiletries, medical instruments, hearth equipment, kitchen utensils, locks and keys, horse trappings, wagon parts, and chains and attachments.

Thus at the oppida (dating principally to the period 150-50 B.C.), the significance of manufacturing to society was different from the case of the Early Iron Age towns. Manufacturing was no longer focused primarily on the production of personal objects for use as demarcators of status and identity. The principal focus of manufacturing was on iron tools, which in turn improved the efficiency of food production and of a wide range of crafts.

European society was becoming an industrialized one, with even the small, outlying communities playing active roles in the production and circulation of materials for growing trade systems. The emphasis of

cultural life had shifted from interaction within the small community context (characteristic of the earlier centuries of the Iron Age), to increasing production in order to participate in expanding commercial networks. Individuals joining in the manufacturing process at the new centers - and in the countryside as well - were stimulated more by the prospect of sharing in the new wealth, in both imported exotic items and in locally-made luxuries, than by the prospect of reinforcing their status identities through the traditional means. The growth of commerce, development of larger-scale industry, and increase in intercultural interaction during the latter parts of the Iron Age brought about profound cultural changes, including change in people's expectations, aspirations, and outlook. The new emphasis at the oppida on the industrial production of tools was both a result and part of the cause of these changes.

At the height of this new industrial activity, the elaborate ornamentation of small objects - e.g. fibulae and bracelets of bronze and glass - virtually disappeared. A new simplicity of form and an acceptance of blank spaces on metal jewelry replaced the rich variety of tightly-packed ornament of the preceding centuries. People's attention and interests were elsewhere than in structuring their identities in the fine ornament of their personal accessories.

An important factor in all of these changes was growing interaction with peoples in other parts of Europe; particularly with the Romans in Italy. Starting around 150 B.C. - just the time that the oppida developed and the iron industry blossomed - Roman imports appeared in the central European archaeological record. They consisted largely of wine amphorae and wine-serving and drinking equipment, including a whole range of bronze and fine ceramic vessels that served as part of the drinking ceremony in the Roman world. Roman coins and metal ornaments were also imported from Italy.

It is clear from the nature of the contexts in which they appear that the Roman imports were held in very high regard (Kunow 1983). The Roman exotic goods began to replace local objects of special favor as means of communicating information among central Europeans, a development that corresponds closely to Dyson's ideas about the intense desire for *terra sigillata* pottery among the various peoples with whom the Romans were in contact.

The changes we observe in the character of locally-made personal paraphernalia - the new plainness of jewelry and weapons at the end of the Iron Age - may be directly attributable to this new valuation of Roman imports. So too the shift of industrial activity at the oppida from manufacturing personal ornaments to manufacturing primarily tools may reflect this decline in the social value of locally-made symbols and the new interest in improving the efficiency of craft production on a broad scale through the manufacture of more and better tools. Many of the crafts industries so served were producing goods specifically for the Roman trade.

Thus by the end of the Iron Age - by the time the Roman armies crossed the Alps in 15 B.C. and brought an end to the flourishing industrial and commercial systems centered at the oppida - manufacturing had come to play a very major role in central European society. Substantial numbers of people had moved from the countryside to the new centers to participate, directly or indirectly, in the expanding industrial activities. The new organization extended into the countryside as well, where smaller communities participated by providing needed materials and willing workers to the new urban complexes. An industrial revolution had taken place during the second century before Christ, and its impact was felt by all Europeans.



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## SOME COMMENTS ON METHOD AND INTERPRETATION

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The range of topics addressed by these papers is so enjoyably diverse that it is difficult to connect the common themes of the cover title. This is hardly surprising since that title offers a broad mandate, broadened further (and rightly) by the inclusion of papers on topics which are, in conventional terms, historic as well as those which are prehistoric. There is little that is explicitly demographic (and who shall blame the authors for skirting that morass?), and production is addressed by Wells, so I shall focus primarily upon "complex social organization," in particular in its relations to production and exchange.

In doing this I shall discuss issues of method rather than theory; not for a lack of concern with theory, but on the contrary because 'theory' (as commonly and often mistakenly perceived) seems often to have diluted, even distorted, concern over method. To be more explicit, what are in effect *assumptions* often masquerade as theory, and inhibit the application of methods which, intelligently pursued, might lead to a re-evaluation of 'theory'. In particular, I take aim at 'theories' (assumptions) which argue that hierarchy is *the* key to "social complexity," and that identification and evaluation of hierarchy will enable us to analyze "social complexity," within which (supposedly) 'types' of production and exchange are functionally embedded. Or, viewed the other way, 'types' of production and exchange supposedly identify functionally correlated degrees or 'types' of "social complexity" which, as widely seen today, means one thing above all--hierarchy.

As I shall note, it is in practice often difficult to distinguish by archaeological analysis one social operating mechanism from another. Thus our archaeological patterns are often plastic in the sense that they can be squeezed to fit two or more 'theoretical' templates without undue distortion. Those templates may not be entirely appropriate, either, as I shall also note. The potential solutions, I suspect, will often be dictated as much by the practical means available as by any theoretical considerations. By this I mean, first, that the particular categories of evidence surviving in a particular area and period may or may not permit us to devise fine-grained analyses to distinguish between one possible interpretation and another; and second, that the historically- attested modes of social operating mechanisms in an area may lead us to favor one interpretation over another for earlier periods without documentation.

In all of this, while commenting upon the papers presented in the original symposium and for the most part included in this volume, I am discussing issues that are far wider and more pervasive in our profession today, for which none of the authors here can be held personally responsible. Rather, where I disagree with this argument or that, I am aiming at widespread current archaeological approaches which I consider need critical comment. I hope, therefore, that my fellow-authors will not feel that I am singling them out personally for attack!

## Historical Archaeology

Historical archaeology (in the proper sense of that term--the archaeology of any documented area and period) has two major prospects. First and most obviously there is the opportunity, for archaeologist and historian alike, to use archaeology in conjunction with the textual record, to amplify that record, to modify it, to alter historical interpretation. Though the methods of interdisciplinary conjunction remain to be determined, considerable advantage can be seen already. The archaeology of Viking sites, for example, has substantially modified our views about characteristic Viking activities by revealing so much evidence for manufacture, trade, and settlement, and has contributed significantly to revisionist historical interpretation. Such modifications are, analytically, neither revolutionary nor profound, but they are substantial, particularly in a cumulative manner, and are most certainly very far from negligible. Second, however, historical archaeology should provide the archaeologist with opportunities to assess patterns of material culture, and changes in those patterns in relation to *known* patterns of language distributions and language changes, population movements, political centralization, and so forth. This will not only feed back constructively into historical archaeology *per se*, but offer opportunities for us to develop 'models' capable of eventual application to prehistoric archaeology--at least to later prehistoric periods in which the variables are likely to be not so wildly different from those of earlier historic periods.

By and large, archaeologists' assessments of change have been made using 'models' drawn from a variety of other disciplines, most notably ethnography, and ethnographic analogy has become something of a standard method of archaeological interpretation. Much of this has been illuminating (though less, in my opinion, than many appear to believe), but ethnographic analogy has two major drawbacks: most ethnographic data has little if any time-depth by which to assess patterns of *change* and so to develop interpretations of process, and most ethnographic reports, particularly those that do assess change necessarily deal with situations in which 'modern' and/or 'western' impact is directly evident, or indirectly highly probable. Historically-derived 'models' for change provide opportunities for overcoming both these drawbacks to the use of ethnographic analogy.

We are far from the goals I have suggested above, but several of the papers in this symposium show that we are at least making some progress. And at this stage, which will doubtless continue for a long time, we need to consider just how, methodologically, we should be assessing our documented contexts. What, as archaeologists, can we gain from working in historical context? Clearly, this is varied in the extreme.

The sources utilized by Carole Crumley (1987)--really restricted to one major source, though a copious one--are contemporaneous and foreign, not native. They are, or appear to be, largely descriptive rather than prescriptive; the bias is fairly clear, the bias of a campaigning general

writing for home consumption and political advantage. Dyson's sources are native, but retrospective not contemporary; there is highly probable bias toward political polemic. In view of the latter probability, it is perhaps likely that, although purporting to be descriptive, they are in fact prescriptive. Gibson's sources are native, and prescriptive rather than descriptive; their degree of contemporaneity is a problem, particularly because it is uncertain to what extent they reflect an earlier Irish society which might have changed in some respects by the time of writing. An advantage to Gibson's sources, compared to Crumley's and Dyson's, is that they prescribe in great detail all manner of situations involving stock, equipment, land, and settlements--all likely to leave physical remains for the archaeologist to identify and analyze. And it is worth pointing out that texts dealing with technology and economy in the broader sense of those terms are rare in historical records, generally, compared to political, military, and ideological texts. Gibson's work, then, can bring an unusually sharp and direct focus on the 'text/artifact' correlation, and is just the sort of research that archaeologists should be undertaking in an effort to elucidate that correlation.

Since Dyson is the only one of the three to address directly the methodological question of textual, in relation to archaeological evidence, let us start there. He contrasts the retrohistoric picture of 2nd century BC Italian farming, supposedly by then largely under 'plantation' type management, with the archaeological evidence from surface survey. The latter appears to show evidence for a landscape dotted with small settlements, suggesting cultivation largely by small farmers. Dyson, reasonably, concludes that the retrohistorical texts are biased toward sociopolitical rhetoric, or even plain misinformed (plausible enough after more than two centuries). On the other hand, the archaeological evidence comes from a relatively restricted area, and is based on surface survey. One cannot survey unlimited areas, still less excavate wholesale, and it is appropriate to suggest the conclusions that he does. There are two problems, though. One is that of archaeological interpretation, irrespective of historic or prehistoric context; the other is that of sociopolitical interpretation.

First, do surface concentrations of apparently domestic debris actually represent settlements? Probably yes, but domestic debris was commonly distributed widely over cultivated land, quite incidentally, in the process of manuring when the farmyard manure pile, onto which discarded household refuse had been thrown, was carted out to the fields. On occasion other mechanisms might be involved, such as redeposition during construction, and erosion and redeposition. The second problem is that of the sociopolitical clothing in which we choose to garb our concentrations of debris. There is clearly a major assumption in Dyson's interpretation: that what appear to be small and relatively densely-distributed settlements reflect a relatively independent class of small farmers. But they could have been bondsmen, or tenants, or even conceivably groups of slaves conveniently located amongst the fields which they worked. For example, the generally dispersed settlement of western Ireland prior to the famine of the 1840s most emphatically did not reflect a high degree of social and political freedom and independence, (still less prosperity!).

So does settlement nucleation represent the heavy hand of the organizing elite, and dispersed settlement a (relatively) independent cultivating class? Or were things often more blurred than that? The critical factor in interpretation here is just what system was employed, in a society with unequal access to resources, by the 'elites' in their extraction of surplus by means of the labor provided by 'workers'? That is to say, we may distinguish inequality of resource consumption in the

archaeological record, but we may have a very difficult time in elucidating the system that produced that observed inequality, let alone of course the circumstances in which that inequality developed. If this is the case for the Late Roman Republic, tolerably well-known historically in many respects, we should not assume that historical documentation is going to provide us with answers to our archaeological questions in any easy or direct fashion.

Crumley's historical material is classical also, but while on the one hand it is contemporaneous it is also external or foreign. Crumley (1974), inferentially, is with Nash (1976) in accepting that Caesar's descriptions of Gaul and the Gauls in the mid-1st century BC were based largely on his own observations rather than being derived from Poseidonius. I agree with this, and that, therefore, one can place some confidence in these descriptions. But we must note that much rests upon the degree of verisimilitude accorded to them, and that there is inevitably some disagreement on that issue. The account of Gaulish social hierarchy, and of clientship in particular, is usually taken to be reasonably accurate, not least perhaps because similar institutions obtained in the Roman world thus arguably permitting Caesar to comprehend and appreciate clientship amongst the Gauls. This is an important point since Crumley argues that this system provided the flexibility to promote rapidly-expanding manufacture and commerce amongst the Aedui and their neighboring allies and client 'tribes'.

The salient point is that this flexibility permitted what she calls a "middle class" of entrepreneurs to emerge as promoters, organizers, and participants. Why does this strike me as plausible? Largely because the textual evidence is both believable and contemporaneous. Here we are not dealing with a retrospective over 200+ years with suspected polemical bias to boot, as in the case with Dyson's historical evidence. But whether we could identify, by archaeological analysis alone, the operation of the Gaulish clientship system, let alone its proposed role in the development of industry and trade, seems dubious. What we can see archaeologically in west-central Europe during the 2nd-1st centuries BC is the rapid development of the famous *oppida* (see Collis 1984 for a very useful recent account) and their role as manufacturing centers. And since there is no satisfactory evidence that these *oppida* were centers of political administration (prior to the Roman conquest of Gaul) we could cautiously suggest that they developed as a result of manufacturing and commercial activities, rather than that these activities were fostered and encouraged by an 'elite' which controlled them centrally.

To that extent archaeology supports Crumley's argument, but it is the *textual* evidence for clientship that makes it plausible to propose that one particular system of operation, rather than any other system without evident central 'elite' initiation and control. We might also ask whether Caesar would have commented upon Gaulish 'state enterprises' of manufacture and commerce had he observed them. This is not a very sound line of reasoning, of course, but does serve to remind us that where Caesar *does* comment upon 'elite' involvement with industry and commerce it is in the context of Dumnorix' purchase of the rights to levy tolls. Dumnorix was clearly then, a predator upon the commercial system rather than any kind of organizer, promoter, or manager. If that can be taken as representative of Gaulish 'elite' involvement (obviously a big "if"), then the textual evidence supports the notion that the driving force behind the development of manufacture and trade was not the top echelon of the aristocratic elite, where (as Caesar makes quite clear) political power was concentrated. I shall comment later on Crumley's advocacy of heterarchical analysis as the appropriate approach to such problems of interpretation.

Before continuing to other matters, it is worth reiterating that the oppida--the earliest known settlements in transalpine Europe to merit consideration as urban centers--appear on present evidence to have been industrial rather than administrative or political centers, since this seems to correspond well with what can be inferred for earlier manufacturing and distribution in later prehistoric Europe. Janet Levy (n.d.), in a paper presented at another session in the same conference, made the point that, in Bronze Age Denmark, metal artifacts were apparently being produced at the *settlement* level, and that there was no indication of any central, 'political' control of the metal industry. This, in turn, reminds us of Gordon Childe's oft-reiterated arguments for an entrepreneurial system of metal production and distribution in Bronze Age Europe. In short, Crumley's argument that the economic 'boom' of Late Iron Age Gaul was effected by an essentially entrepreneurial system, operating through a flexible organization of clientship arrangements could be seen as entirely congruent with general principles of production and exchange which may be argued for preceding periods. That, in turn, prompts one to wonder whether clientship, specifically, might have been an important operative mechanism in earlier times, too.

Gibson uses the medieval Irish law codifications to develop a model for the interpretation of settlement patterns in north Co. Clare, Ireland. As noted above, those law tracts may not, of course, represent Early Medieval Irish society precisely. First, they are prescriptive. Second, they may incorporate some archaic features. Third, Irish society was not static throughout the earlier Middle Ages, so some features of the 'laws', although perhaps appropriate to the society when written, may not have been so several centuries later. Nevertheless, despite the problems, we have an area and period where a non-state social order produced a sort of 'blueprint' of itself in writing, and that is virtually unique.

Probably because Irish society was rural, not urban-oriented, there is much information about the rural economy and its technology. This is not for its own sake, but largely because (a) many legal disputes evidently were about such matters (e.g. damage to and trespass upon farm lands), and (b), more importantly, social status was legally defined by *díre* (honor price). *Díre* was correlated with material possessions, including stock and farm equipment, with entitlement (or otherwise) to certain types of residence; and above all with clientship--the more clients, the higher the status, with even the hegemony of greater kings over lesser conceived of in terms of clientship. Clearly, clientship was a primary mechanism in the social and political system. Gibson, then, has astutely zeroed in on a richly documented non-state society in order to evaluate the archaeological record in relation to its historical context. His focal site, Cahercommaun, would make sense as the residence of the highest-ranking local person (the *rí tuaithe* perhaps?) or kin-group. The smaller sites of the locality should represent the residences of lesser aristocrats and more prosperous 'commoners', some perhaps 'noble clients' (as opposed to 'base clients') of the occupant(s) of Cahercommaun.

However, we have the same archaeological problem as with Gaulish clientship: if we had no documentation, how would we distinguish between clientship, tenancy, 'outfarms' inhabited by estate managers, or some other socioeconomic arrangement? The problem is compounded by the difficulty of identifying the residences inhabited by the lower orders. If indeed enclosed settlements (the 'ringforts') were the prerogative of the wealthier classes, as the legal texts suggest, then a whole layer of society is so far virtually missing from the archaeological record of earlier medieval Ireland (see, for example, McCourt 1971: 152-3; Swan 1983: 277). Hardly Gibson's fault, of course, but it does make interpretation even more problematical. And I am not convinced that



recourse to ethnographic analogy solves the problem (see below).

So far, then, we can see that the archaeologist is assisted enormously by the availability of textual evidence, even though methodological problems arise both in using those texts and in relating texts to archaeology. What I do not yet see is how the partly-documented archaeological situation can be developed into a 'model' for wider application, application beyond the local, the regional; application beyond the context of what can be seen or argued as the 'cultural tradition' of an area. Thus I have suggested that the historically-documented institution of clientship might be considered applicable to later European prehistory, at least north of the Alps to the earlier Iron Age, to the Bronze Age, perhaps even to the later Neolithic. But could it be reasonably applied to similar archaeological patterns in other parts of the world, to which a 'European cultural tradition' was clearly inapplicable?

### **Ethnographic Analogy**

Archaeologists employ ethnographic analogy in their attempts to elucidate the articulation between material culture, the basic data-set of archaeology, and social manifestations that do not leave a direct and relatively unambiguous material record. Do differences in the disposal of the dead reflect differences between distinct societies, and between 'ranks' or 'classes' in a single society? Do variations in pottery style reflect residence rules within a society? Do different types of economic system correlate with different types of political systems? And so forth. Our archaeological data being largely technological (from potsherds to large-scale landscape modifications), one classic problem is to see whether technological patterns correspond to economic patterns, and if those, in turn, correspond to 'types' of social and political system. We have two examples to discuss here: the papers by Gibson and Arnold. Both, in essence, attempt to elucidate the relations between economic systems and sociopolitical systems; Gibson has the advantage of an historically documented society, while Arnold does not. Since we have been discussing Gibson's work in the context of historical archaeology, let us continue to discuss that research in ethnographic context.

Gibson invokes African pastoral and part-pastoral societies of varying degrees of "complexity" in an attempt to place Early Medieval Ireland into a systemic pattern relating pastoralism as an economic system to social and political organization. The focus is the distribution of cattle--that they are inequitably inherited and that vagaries of weather and disease make it functionally advantageous for owners of more stock to spread risk, and gain adherents and obligations, by distributing cattle to clients or to kin. This indirect form of economic control, in turn, inhibits 'state formation'. While not necessarily disagreeing with any of this, I do have some problems.

First, is it *only* in pastoral societies that economic resources are distributed to kin or to 'clients', and is clientship so closely correlated with stock-raising? Some stock-raisers simply hire herdsmen, or (very typically) have complex contractual arrangements with agriculturalists for seasonal grazing-rights and temporary help with herd management. In Early Medieval Ireland itself the legal texts on status and on clientship make it abundantly clear that the economy was mixed, for agricultural equipment and products figure prominently, as well as stock.

Second, numerous historically-recorded states have formed without any evidence of large-scale central control of the economy, including states

in which stock-raising was a substantial economic resource. Clearly, a state must extract some surplus and service in order to develop and maintain centralized political power, but this does not have to involve direct control over large sections of the economy.

Third, if earlier Medieval Ireland has not been clearly established as part of a well-defined cross-cultural pattern (and I suggest above that it has not), then what analytical insight is gained? Are we left with analogy that is merely sufficiently plausible to beguile the less wary, but will not stand up to point-by-point evaluation?

Arnold proposes that slavery was part of the Hallstatt C-D social system in Central Europe, invoking both circumstantial evidence from Europe itself and general ethnographic analogy. She raises the old problem of what was exported from central Europe in return for Greek and Etruscan luxury goods, since no identifiable central European artifacts are found in the Mediterranean at this time. In later centuries various perishable and/or non-diagnostic goods were sent to the Mediterranean from the north--grain, livestock and livestock products, furs, and indeed slaves. So why not slaves earlier on, too? She suggests that slave-labor was employed in constructing the large-scale Hallstatt C-D hillforts and barrows.

To this line of reasoning I respond first by asking (with Bintliff 1984: 167) whether the actually rather modest quantities of Greek and Etruscan imports were sufficient to stimulate a major transformation of the central European economic system, let alone stimulate a slave-trade? How many slaves would have been an adequate exchange? A few dozen per decade might be a reasonable guess--hardly enough to promote a major economic reorganization. Second, if Hallstatt C-D construction work conjures up notions of slave-labor, then what about the larger megalithic monuments and henges of the middle and later Neolithic? Or Gothic cathedrals? Third, where we do have information on native Hallstatt C-D manual workers, from the salt-miners of Hallstatt itself, we find a population which was both well-nourished and of above-average prosperity (see Wells 1984: 79-89, 98, for a handy summary). No sign of slave-labor there.

Arnold's line of general ethnographic analogy argues that the slave-trade of recent times was part of a pattern in which manufactured 'western' goods were exchanged for raw materials, which included slaves. The implication (not pursued) is that this is a general pattern in the economic interaction between 'advanced' and 'simple' economic systems. One asks, simply, is this so? Often perhaps it was. But the Inca and Aztec empires, for example, which should, according to such theory, be prime candidates for the use of slave-labor and had neighboring 'simple' economies to exploit, do not appear to have imported slaves or to have had slave economies.

However, although unconvinced by her arguments about slavery, I am fully behind Arnold in her question as to whether we *could* identify slavery in the archaeological record. She makes suggestions for archaeological research along these lines in Hallstatt C-D, and other early European contexts, citing recent investigations in the south-eastern U.S.A. and the Caribbean as possible models. These latter, of course, are from well-documented recent societies in which the widespread use of slave-labor is not in doubt. Before we could utilize these models, however, we would need careful investigation of the distinctions to be made between *slave* sites and *other* sites occupied by economically depressed, but free, communities. That is, we would first need to be reasonably sure that we could distinguish, say, slave quarters from the

dwellings of share-croppers, or poor tenants, or even perhaps poor land-owning classes.

In taking issue with Gibson and Arnold on ethnographic analogy, I hope that my main point is evident: that it is incumbent upon the proposer of an argument to persuade the reader, and not upon the reader to provide detailed and exhaustive refutation of the argument. In a nutshell, I find that their proposed analogies are just not based upon broad enough comparisons. They may reasonably enough object that they can hardly be expected to review the whole ethnographic literature, and that all 'rules' may have exceptions which do not invalidate the general applicability of the rule. These are both fair points. But far too many invocations of ethnographic analogy promoted as 'explanations' of the archaeological record are far too selective, and do not even consider whether the generalizations proposed really are generalizations.

## Conclusion

What, then, may we conclude from the articles in this book? First, I think we may conclude that dialogue between prehistoric and historic archaeologists is stimulating, and I suggest in the longer run essential. The historic record may eventually provide us with case-studies of the interrelationships between the technological, economic, and sociopolitical spheres as they change through time; case-studies which should be stronger than the largely 'static' analogies which can be drawn from the ethnographic record alone. Second, it looks to me as if it is going to be extremely difficult to distinguish at the finer-grained level of interpretation between this or that type of socioeconomic mechanism. Overall, historical archaeology gives us some confidence that differentiation in burial, for example, may often indicate differentiation in social life, or that 'elites' of one type or another are indeed strongly inclined to initiate monumental construction. So far so good, but what *type* of differentiated society can be distinguished? Just *how* did the various status groups or layers in a differentiated society articulate with each other? Just what were the mechanisms?

More encouragingly, one sees some healthy signs of methodological progress. My reserve about the use of ethnographic analogy (above) is very considerably tempered by the observation that in other respects both Arnold and Gibson are identifying areas and periods where substantive questions can be asked, and they are asking them even if both resort to uniformitarian approaches in their quest for plausible interpretation.

It is noticeable that the most successful uses of uniformitarianism are the Geselowitz and Murray/Schoeninger articles where the uniformitarianism is physico-chemical: here we are certainly on far firmer ground in using uniformitarian principles than we are in dealing with social and political forms. For the latter approach, we must remember that anthropologists dealing with hunter-gatherer societies are already clearly uneasy about, even in revolt against, the application of uniformitarian principles to our interpretations of those societies (cf. Schrire 1984). And in this volume, Dyson has some trenchant remarks to make about the application of uniformitarianism to the interpretation of society in classical antiquity. So, returning for example to the early Iron Age of Hallstatt C and D we see that bone analyses of burials, in relation to hypothesized status, does *not* support the notion that apparent differences in social status correlate with detectable differences in diet. This does not of course demonstrate that such postulated social differentiation did

not exist, but does suggest strongly that it may not have resulted in a nutritionally-deprived underclass. And this conclusion is in harmony with other lines of evidence for that area and period noted above.

This, in turn, enables us to ask with at least slightly more authority just what was the degree of social differentiation in central Europe during Hallstatt C/D? Or, to be more precise, what was the degree of such differentiation in *eastern* Hallstatt C/D? For that area, where the analyses were carried out, shows rather less archaeological evidence for marked social differentiation than the *western* Hallstatt C/D area, with its spectacularly rich 'princely' graves. If similar bone analyses could be effected in that area, would we see a correspondingly greater differentiation in nutritional status? We can at least now pose such questions.

On a second, and final, methodological tack I conclude with an enthusiastic response to Crumley's advocacy of heterarchical analysis. For too long has archaeology been mesmerized by hierarchy and the notion inherent in most hypothetical schemes of cultural evolution, that cultural evolutionary 'progress' is to be measured in terms of increased evidence for hierarchy. This, of course, is because such evolutionary schemes advocate relatively close linkages between economic development (as measured by observed technological development, with its hypothesized corollary of increasing craft specialization) and increasing sociopolitical hierarchy. This approach has elements of the self-fulfilling prophecy since observed techno-economic complexity does indeed seem to increase parallel to inferred sociopolitical complexity, at least roughly.

The temptation to infer causality has been overwhelming. But if one shifts the methodological sights to another dimension, that of heterarchy, a different perspective may be obtained in which interaction at a given 'level' (e.g. economic) may be seen to increase in scale or in intensity, or both, or to change in some arguably significant dimension such as inferred technological expertise (cf. Geselowitz' article). A heterarchical approach could be accused of mere 'functionalism', but it is functionalist in the rational and thoroughly defensible manner of comparing and analyzing functionally interrelated factors (e.g. production, manufacture and trade) rather than factors which are only hypothetically interrelated (e.g. economic and sociopolitical spheres). None of this is to deny that we should study hierarchy, or that we should deny any interpretative role to hierarchy. But it should prevent us from falling into the trap of analyzing what we consider to be 'cause' and 'effect' simultaneously, thus reinforcing our received views that the two are inextricably intertwined. Rather, a heterarchical approach should enable us to analyze 'like' and 'like' in a constructive and more objective manner, leaving the comparison of 'unlike' with 'unlike', and the analysis of their possible interrelationships, to a later stage of the interpretative process. It may then be far easier to see to what extent technological and economic developments really are correlated with social and political developments, and so to argue in a less predetermined manner whether and how the two may be causally related.

We are, as a profession, in grave danger of succumbing to a new determinism, ironically brought about by the right and proper search for explanation promoted by the 'new archaeology'. But we must not predetermine the explanations we seek by limiting the range of questions that we ask, or we shall make little real interpretative advance.

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